

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 5,0 C  
Edition : 16.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/11F2250 R274  
Type number : 0 460 414 045  
  
Customer-specific information  
Customer : PERKINS  
  
Engine : TC MARINE

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0,35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

### Start of delivery

Indicator setting:  
Piston stroke mm: 1.28  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value mm: 3,9...4,3

### Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 800  
Setting value bar: 7,1...7,7

### Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 66,1...67,1  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

### Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 17,8...18,8

### Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm<sup>3</sup>/  
1000H.: 10,0...12,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,0)

### Full-load speed regulation:

Speed 1/min: 2500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/  
1000H.: 23,5...25,5

### Start:

Speed 1/min: 100  
Del. quantity : 62,0...98,0  
mind cm<sup>3</sup>/1000H.: -

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)

KSB solenoid-operated  
valve volt: -  
2nd speed 1/min: 1500  
Charge press. hPa: 800  
TD travel mm: -  
mm: (3,4...4,8)

KSB solenoid-operated  
valve volt: -  
3rd speed 1/min: 1800  
Charge press. hPa: 800  
TD travel mm: 4,9...5,7  
mm: (4,6...6,0)

KSB solenoid-operated  
valve volt: -

4th speed 1/min: 500  
Charge press. hPa: 800  
TD travel mm: 1,0...3,0  
mm: -

KSB solenoid-operated  
valve volt: 12,0

5th speed 1/min: 1000  
Charge press. hPa: 800  
TD travel mm: 3,3...5,3  
mm: -

KSB solenoid-operated  
valve volt: 12,0

#### Supply-pump pressure characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 800  
Supply-pump pressure bar: 6,1...6,7  
2nd speed 1/min: 1800  
Charge press. hPa: 800  
Supply-pump pressure bar: 7,7...8,3

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 2250  
Charge press. hPa: 800  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 500  
Charge-air pressure-setting point hPa: 300  
Del. quantity cm<sup>3</sup>/: 32,5...33,5  
1000H.: (29,6...36,4)  
2nd speed 1/min: 2600  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: 0,0...6,0  
1000H.: -

3rd speed 1/min: 2500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (20,0...29,0)

4th speed 1/min: 2250  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: 68,5...72,5  
1000H.: (67,9...73,1)

5th speed 1/min: 1500  
Charge press. hPa: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (64,0...69,2)

6th speed 1/min: 500  
Charge press. hPa: 800

Del. quantity cm<sup>3</sup>/: 58,3...64,3  
1000H.: (57,9...64,7)  
7th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (15,7...20,9)

#### Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2250  
Del. quantity cm<sup>3</sup>/: -  
1000H.: -

#### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,5...15,5)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 2,0...8,0  
1000H.: (0,0...9,5)

#### Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 30,0

#### Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

#### Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : K-0T  
MS mm : 0,7..0,95  
SVS max. mm : 3,0

#### Remarks:

Correction at adjusting nut (46)

Pushing electromagnet.



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 4,4 A  
Edition : 17.07.87  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/11F1200 R277  
Type number : 0 460 414 047

Customer-specific information  
Customer : CASE

Engine : D 268/885

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800  
Setting value mm: 5,1...5,6

Supply-pump pressure:

Speed 1/min: 800  
Setting value bar: 3,7...4,3

Full-load del. w/out charge press.:

Speed 1/min : 800

Del. quantity cm<sup>3</sup>/  
1000H.: 81,5...82,5  
Dispersion cm<sup>3</sup>/: 3,5  
1000H.: (4,0)

Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/  
1000H.: 16,5...20,5  
Dispersion cm<sup>3</sup>/: 3,0  
1000H.: (3,5)

Full-load speed regulation:

Speed 1/min: 1260  
Del. quantity cm<sup>3</sup>/  
1000H.: 54,0...60,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 85,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 2,6...3,4  
mm: (2,3...3,7)  
2nd speed 1/min: 800  
TD travel mm: -  
mm: (4,6...6,0)  
3rd speed 1/min: 1150  
TD travel mm: 7,4...8,2  
mm: (7,1...8,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,6...3,2  
2nd speed 1/min: 1150  
Supply-pump  
pressure bar: 5,0...5,6

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 1400

Del. quantity cm<sup>3</sup>/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1370  
Del. quantity cm<sup>3</sup>/: 0,0...10,0  
1000H.: -  
3rd speed 1/min: 1320  
Del. quantity cm<sup>3</sup>/: 10,0...40,0  
1000H.: -  
4th speed 1/min: 1260  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (52,5...61,5)  
5th speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 84,0...87,0  
1000H.: (82,5...88,5)  
6th speed 1/min: 800  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (79,5...84,5)  
7th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/: 75,5...79,5  
1000H.: (74,0...81,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/: 0..3  
1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (14,0...23,0)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 80,0

2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
ex. 1000H.: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4  
KF mm : 5,4...5,7  
MS mm : 1,2...1,45

A04

SVS max. mm : 1,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CAS 4,4 B  
Edition : 17.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/11F1150 R277-1  
Type number : 0 460 414 048

Customer-specific information  
Customer : CASE

Engine : D 268/844S

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 800  
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 800  
Setting value bar: 4,2...4,8

Full-load del. w/out charge press.:

Speed 1/min : 800

Del. quantity cm3/  
1000H.: 80,7...81,7  
Dispersion cm3/: 3,5  
1000H.: (4,0)

#### Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm3/  
1000H.: 16,5...20,5  
Dispersion cm3/: 3,5  
1000H.: (4,0)

#### Full-load speed regulation:

Speed 1/min: 1190  
Del. quantity cm3/  
1000H.: 52,0...58,0

#### Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 85,0

#### Inspection-pump test specifications Test specifications in parentheses

#### Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 800  
TD travel mm: -  
mm: (2,8...4,2)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 3,1...3,7  
2nd speed 1/min: 1100  
Supply-pump pressure bar: 5,2...6,0

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm3/10s: 41...83  
cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow quantity cm3/10s: 55...138  
cm3/10s: (40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 1300

Del. quantity cm3/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1270  
Del. quantity cm3/: 0,0...10,0  
1000H.: -  
3rd speed 1/min: 1220  
Del. quantity cm3/: 10,0...40,0  
1000H.: -  
4th speed 1/min: 1190  
Del. quantity cm3/: -  
1000H.: (50,5...59,5)  
5th speed 1/min: 1000  
Del. quantity cm3/: 82,2...85,2  
1000H.: (80,7...86,7)  
6th speed 1/min: 800  
Del. quantity cm3/: -  
1000H.: (78,7...83,7)  
7th speed 1/min: 500  
Del. quantity cm3/: 76,7...80,7  
1000H.: (75,2...82,2)

#### Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1150  
Del. quantity cm3/: 0...3  
1000H.: -

#### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 350  
Del. quantity cm3/: -  
1000H.: (14,0...23,0)  
2nd speed 1/min: 450  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm3/: -  
ind. 1000H.: 80,0  
2nd speed 1/min: 450  
Del. quantity cm3/: -  
ax. 1000H.: 80,0

#### Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

#### Mounting and assembly dimensions:

#### Designation

K mm : 3,2...3,4  
KF mm : 5,4...5,7  
MS mm : 1,2...1,45

SVS max. mm : 3,8

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 5,6 PS  
Edition : 20.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/11F1500 R55-9  
Type number : 0 460 416 056

Customer-specific information  
Customer : MAN

Engine : D0 226 MF

Power k: 100  
Speed 1/mi: 3000

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,6  
(from BDC): +-0,02 (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1000  
Setting value mm: 6,0...6,4

Supply-pump pressure:

Speed 1/min: 1000  
Setting value bar: 5,7...6,3

## Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del. quantity cm<sup>3</sup>/ :  
1000H.: 63,5...64,5  
Dispersion cm<sup>3</sup>/ : 3,5  
1000H.: (4,0)

## Low-idle speed regulation:

Speed 1/min: 350  
Del. quantity cm<sup>3</sup>/ :  
1000H.: 7,0...11,0  
Dispersion cm<sup>3</sup>/ : 3,0  
1000H.: (4,0)

## Full-load speed regulation:

Speed 1/min: 1550  
Del. quantity cm<sup>3</sup>/ :  
1000H.: 52,0...58,0

## Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 50,0

## Inspection-pump test specifications Test specifications in parentheses

## Timing-device characteristic:

1st speed 1/min: 600  
TD travel mm: 3,3...4,1  
mm: (3,0...4,4)  
2nd speed 1/min: 1000  
TD travel mm: -  
mm: (5,5...6,9)  
3rd speed 1/min: 1400  
TD travel mm: 8,6...9,4  
mm: (8,3...9,7)

## Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 4,2...4,8  
2nd speed 1/min: 1500  
Supply-pump pressure bar: 7,5...8,1

## Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1500  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
2nd speed 1/min: 1500  
Overflow quantity cm<sup>3</sup>/10s: (40...153)

## Delivery-quant. and breakaway char.:

1st speed 1/min: 1620  
Del. quantity cm<sup>3</sup>/ : 16,0...24,0  
1000H.: (15,5...24,5)  
2nd speed 1/min: 1550  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (50,5...59,5)  
3rd speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/ : 69,8...72,2  
1000H.: (68,4...73,6)  
4th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (61,4...66,6)  
5th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/ : 45,8...49,2  
1000H.: (44,1...50,9)

## Zero delivery (stop):

## Mech. shutoff:

Speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: -

## Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (4,5...13,5)  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/ : 0,0...2,0  
1000H.: -

## Automatic starting fuel delivery:

1st speed 1/min: 370  
Del. quantity cm<sup>3</sup>/ : -  
ind. 1000H.: 55,0  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/ : -  
ax. 1000H.: 55,0

## Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

## Mounting and assembly dimensions:

## Designation

K	mm	:	-
KF	mm	:	5,7...6,0
MS	mm	:	1,2...1,45
SVS max.	mm	:	2,5
XK	mm	:	17,0...19,0
XL	mm	:	13,3...16,7

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N4  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022  
Customer Part-No. : 390 7152

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-3,9IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm : 1,8  
mm :  $\pm 0,02$  (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

### Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

### Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 59,0...60,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1140  
Del.quantity cm3/  
1000H.: 45,0...51,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1100  
TD travel mm: 3,1...3,9  
mm: (2,8...4,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 4,9...5,5

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1210  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1170  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1140  
Del.quantity cm3/: -  
1000H.: (43,0...53,0)  
5th speed 1/min: 1100  
Del.quantity cm3/: 58,0...61,0  
1000H.: (56,5...62,5)  
6th speed 1/min: 900  
Del.quantity cm3/: 57,5...60,5  
1000H.: (56,0...62,0)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (56,5...62,5)  
8th speed 1/min: 500  
Del.quantity cm3/: 50,0...58,0  
1000H.: (49,0...59,0)

### Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 110  
Del.quantity cm3/: -  
ind. 1000H.: 50,0

2nd speed 1/min: 200  
Del. quantity cm3/: -  
ex. 1000H: 50,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,2
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N7  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022  
Customer Part-No. : 390 7964

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-3,9IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm : 1,8  
mm :  $\pm 0,02$  (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

### Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

### Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm<sup>3</sup>/1000H.: 75,5...71,5  
Dispersion cm<sup>3</sup>/1000H.: 4,0 (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm<sup>3</sup>/1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/1000H.: 55,0...61,0

### Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1 (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: - (1,8...3,2)  
3rd speed 1/min: 1000  
TD travel mm: 2,7...3,5 (2,4...3,8)

### Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9  
3rd speed 1/min: 1000  
Supply-pump pressure bar: 4,9...5,5

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1150  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...2,0  
2nd speed 1/min: 1130  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
3rd speed 1/min: 1090  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
4th speed 1/min: 1050  
Del. quantity cm<sup>3</sup>/1000H.: (55,0...61,0)  
5th speed 1/min: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 67,5...70,5 (66,0...72,0)  
6th speed 1/min: 900  
Del. quantity cm<sup>3</sup>/1000H.: 69,5...72,5 (68,0...74,0)  
7th speed 1/min: 750  
Del. quantity cm<sup>3</sup>/1000H.: (73,0...79,0)  
8th speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000H.: 75,0...83,0 (74,0...84,0)

### Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del. quantity cm<sup>3</sup>/1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...4,0

### Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm<sup>3</sup>/ind. 1000H.: 80,0

2nd speed 1/min: 240  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,2
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N3  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022  
Customer Part-No. : 390 8186

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT -3,9IND.

Power k: 68,5  
Speed 1/mi: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm:  $\pm 0,02$  (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm3/  
1000H.: 69,0...70,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1110  
Del.quantity cm3/  
1000H.: 49,0...55,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1050  
TD travel mm: 2,8...3,6  
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9

3rd speed 1/min: 1050  
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Oveflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1180  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1140  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1110  
Del.quantity cm3/: -  
1000H.: (47,0...57,0)  
5th speed 1/min: 1050  
Del.quantity cm3/: 66,0...69,0  
1000H.: (64,5...70,5)  
6th speed 1/min: 900  
Del.quantity cm3/: -  
1000H.: (66,5...72,5)  
7th speed 1/min: 750  
Del.quantity cm3/: 72,0...76,0  
1000H.: (71,0...77,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 72,0...80,0  
1000H.: (71,0...81,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130



Del. quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 240  
Del. quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	3,8
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N5  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022  
Customer Part-No. : 390 8187

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-3,9IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Start of delivery block  
Piston stroke mm : 1,8  
mm : +-0,02 (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

### Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

### Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 59,0...60,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1140  
Del.quantity cm3/  
1000H.: 45,0...51,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1100  
TD travel mm: 3,1...3,9  
mm: (2,8...4,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9  
3rd speed 1/min: 1100  
Supply-pump pressure bar: 4,9...5,5

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1210  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1170  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1140  
Del.quantity cm3/: -  
1000H.: (43,0...53,0)  
5th speed 1/min: 1100  
Del.quantity cm3/: 58,0...61,0  
1000H.: (56,5...62,5)  
6th speed 1/min: 900  
Del.quantity cm3/: 57,5...60,5  
1000H.: (56,0...62,0)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (56,5...62,5)  
8th speed 1/min: 500  
Del.quantity cm3/: 50,0...58,0  
1000H.: (49,0...59,0)

### Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 110  
Del.quantity cm3/: -  
ind. 1000H.: 50,0

2nd speed 1/min: 200  
Del. quantity cm3/: -  
ax. 1000H: 50,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 4,2
XK	mm	: 18,8...20,8
XL	mm	: 12,2...15,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N2  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022  
Customer Part-No. : 390 9405

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT -3,9IND.

Power k: 68,5  
Speed 1/mi: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +-0,02 (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

Full-load del. w/out charge press.:

Speed 1/min: 900  
Del. quantity cm3/  
1000H.: 69,0...70,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1110  
Del. quantity cm3/  
1000H.: 49,0...55,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1050  
TD travel mm: 2,8...3,6  
mm: (2,5...3,9)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9

3rd speed 1/min: 1050  
Supply-pump pressure bar: 4,8...5,4

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del. quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1180  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1140  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1110  
Del. quantity cm3/: -  
1000H.: (47,0...57,0)  
5th speed 1/min: 1050  
Del. quantity cm3/: 66,0...69,0  
1000H.: (64,5...70,5)  
6th speed 1/min: 900  
Del. quantity cm3/: -  
1000H.: (66,5...72,5)  
7th speed 1/min: 750  
Del. quantity cm3/: 72,0...76,0  
1000H.: (71,0...77,0)  
8th speed 1/min: 500  
Del. quantity cm3/: 72,0...80,0  
1000H.: (71,0...81,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del. quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 240  
Del. quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	3,0
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N6  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1100 R226  
Type number : 0 460 424 022  
Customer Part-No. : 391 0628

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-3,9IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Start of delivery block  
Piston stroke mm : 1,8  
mm : +-0,02 (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,3...2,7



### Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,1...4,7

### Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 75,5...71,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1050  
Del.quantity cm3/  
1000H.: 55,0...61,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 1,3...2,1  
mm: (1,0...2,4)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,8...3,2)  
3rd speed 1/min: 1000  
TD travel mm: 2,7...3,5  
mm: (2,4...3,8)

### Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,8...1,4  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,3...2,9  
3rd speed 1/min: 1000  
Supply-pump pressure bar: 4,9...5,5

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1000  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1150  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1130  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1090  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1050  
Del.quantity cm3/: -  
1000H.: (55,0...61,0)  
5th speed 1/min: 1000  
Del.quantity cm3/: 67,5...70,5  
1000H.: (66,0...72,0)  
6th speed 1/min: 900  
Del.quantity cm3/: 69,5...72,5  
1000H.: (68,0...74,0)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (73,0...79,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 75,0...83,0  
1000H.: (74,0...84,0)

### Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H.: 80,0

2nd speed 1/min: 240  
Del. quantity cm3/: -  
ex. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,45
SVS max.	mm	:	4,2
XK	mm	:	18,8...20,8
XL	mm	:	12,2...15,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 E1  
Edition : 20.07.87  
replaces : 11.12.86  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1150 R226-1  
Type number : 0 460 424 023

Customer-specific information  
Customer : CUMMINS

Engine : 4BT-3.9

Power k: 53  
Speed 1/mi: 2300

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: +-0,02 (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,2...4,8

Full-load del. w/out charge press.:

Speed 1/min : 900  
Del.quantity cm3/  
1000H.: 67,0...68,0  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1190  
Del.quantity cm3/  
1000H.: 47,0...53,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,5...2,9)  
3rd speed 1/min: 1150  
TD travel mm: 3,2...4,0  
mm: (2,9...4,3)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 0,9...1,5  
2nd speed 1/min: 500  
Supply-pump pressure bar: 2,5...3,1  
3rd speed 1/min: 1150

Supply-pump pressure bar: 5,2...5,8

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1150  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1300  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1260  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1220  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1190  
Del.quantity cm3/: -  
1000H.: (45,0...55,0)  
5th speed 1/min: 1150  
Del.quantity cm3/: 63,5...66,5  
1000H.: (62,0...68,0)  
6th speed 1/min: 900  
Del.quantity cm3/: -  
1000H.: (64,5...70,5)  
7th speed 1/min: 750  
Del.quantity cm3/: 69,5...73,5  
1000H.: (67,8...75,2)  
8th speed 1/min: 500  
Del.quantity cm3/: 68,0...76,0  
1000H.: (67,0...77,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del. quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 240  
Del. quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,0
XK	mm	:	18,8...20,8
XL	mm	:	11,7...15,1

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R226-2  
Type number : 0 460 424 024  
Customer Part-No. : 390 7151

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-3,9IND

Power k: 64  
Speed 1/mi: 2500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm:  $\pm 0,02$  (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,6...5,2

Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm3/  
1000H.: 57,5...58,5  
Dispersion cm3/: 4,6  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 335  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm3/  
1000H.: 40,0...46,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,5...2,9)  
3rd speed 1/min: 1100  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump  
pressure bar: 1,3...1,9  
2nd speed 1/min: 750  
Supply-pump  
pressure bar: 3,9...4,5

3rd speed 1/min: 1100  
Supply-pump  
pressure bar: 5,4...6,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1370  
Del.quantity cm3/: 0,0...15  
1000H.: -  
3rd speed 1/min: 1330  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1300  
Del.quantity cm3/: -  
1000H.: (38,0...48,0)  
5th speed 1/min: 1250  
Del.quantity cm3/: 55,5...58,5  
1000H.: (54,0...60,0)  
6th speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: (55,0...61,0)  
7th speed 1/min: 750  
Del.quantity cm3/: 55,5...59,5  
1000H.: (54,5...60,5)  
8th speed 1/min: 500  
Del.quantity cm3/: 49,0...57,0  
1000H.: (48,0...58,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 335  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 335  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del. quantity cm3/: -  
ind. 1000H: 60,0

2nd speed 1/min: 230  
Del. quantity cm3/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,1...5,4  
MS mm : 1,2...1,45  
SVS max. mm : 4,2

Remarks:



## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N1  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/12F1250 R226-2  
Type number : 0 460 424 024  
Customer Part-No. : 391 2245

Customer-specific information  
Customer : CUMMINS

Engine : 4 BT-3,9IND

Power k: 64  
Speed 1/mi: 2500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,8  
mm: 0,02 (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 900  
Setting value mm: 2,0...2,4

Supply-pump pressure:

Speed 1/min: 900  
Setting value bar: 4,6...5,2

Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000H.: 57,5...58,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 335  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1300  
Del. quantity cm3/  
1000H.: 40,0...46,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 750  
TD travel mm: 0,8...1,6  
mm: (0,5...1,9)  
2nd speed 1/min: 900  
TD travel mm: -  
mm: (1,5...2,9)  
3rd speed 1/min: 1100  
TD travel mm: 2,9...3,7  
mm: (2,6...4,0)

Supply-pump pressure characteristic:

1st speed 1/min: 200  
Supply-pump pressure bar: 1,3...1,9  
2nd speed 1/min: 750  
Supply-pump pressure bar: 3,9...4,5

3rd speed 1/min: 1100  
Supply-pump pressure bar: 5,4...6,0

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1400  
Del. quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1370  
Del. quantity cm3/: 0,0...15  
1000H.: -  
3rd speed 1/min: 1330  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1300  
Del. quantity cm3/: -  
1000H.: (38,0...48,0)  
5th speed 1/min: 1250  
Del. quantity cm3/: 55,5...58,5  
1000H.: (54,0...60,0)  
6th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (55,0...61,0)  
7th speed 1/min: 750  
Del. quantity cm3/: 55,5...59,5  
1000H.: (54,5...60,5)  
8th speed 1/min: 500  
Del. quantity cm3/: 49,0...57,0  
1000H.: (48,0...58,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 335  
ELAB volt: -  
Del. quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 335  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130

Del.quantity cm3/: -  
ind. 1000H: 60,0

2nd speed 1/min: 230  
Del.quantity cm3/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,2...1,45
SVS max.	mm	:	4,2

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N8  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/12F1150 R231-1  
Type number : 0 460 424 029  
Customer Part-No. : 390 8196

Customer-specific information  
Customer : CUMMINS

Engine : 4 BTA-3,9

Power k: 79  
Speed 1/mi: 2200

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,55  
mm: +-0,02 (0,06)  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3,8...4,2

#### Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 5,1...5,7

#### Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 85,5...86,5  
Dispersion cm<sup>3</sup> : 4,0  
1000H : (4,5)

#### Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 66,5...67,5

#### Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/: -  
1000H.: 5,5

#### Full-load speed regulation:

Speed 1/min: 1170  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H: 63,0...69,0

#### Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

#### Inspection-pump test specifications Test specifications in parentheses

#### Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)  
2nd speed 1/min: 750  
Charge press. hPa: 1000

TD travel mm: -  
mm: (3,3...4,7)  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 4,9...5,7  
mm: (4,6...6,0)

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3,9...4,5  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6,5...7,1

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del. quantity cm<sup>3</sup>/: 82,0...83,0  
1000H.: (79,5...85,5)  
2nd speed 1/min: 1260  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0,0...2,0  
1000H.: -  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1220  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
5th speed 1/min: 1170  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (61,0...71,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 77,5...80,5  
1000H.: (76,0...82,0)  
7th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 80,0...83,0  
1000H.: (78,5...84,5)  
8th speed 1/min: 850

Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H: (83,0...89,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 90,0...98,0  
1000H: (89,0...99,0)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
1000H: (64,0...70,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm<sup>3</sup>/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 26,0...34,0  
1000H.: (25,0...35,0)  
2nd speed 1/min: 375  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 65,0  
2nd speed 1/min: 240  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 65,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,1...5,4  
MS mm : 1,1...1,35  
SVS max. mm : 2,2

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 3,9 N9  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 4/12F1150 R231-1  
Type number : 0 460 424 029  
Customer Part-No. : 390 9407

Customer-specific information  
Customer : CUMMINS

Engine : 4 BTA-3,9

Power k: 79  
Speed 1/mi: 2200

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm : 1,55  
mm :  $\pm 0,02$  (0,06)

Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

B13

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 5,1...5,7

Full-load del. with charge press.:

Speed 1/min: 850  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 85,5...86,5  
Dispersion cm<sup>3</sup>/  
1000H : (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 66,5...67,5

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1170  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H: 63,0...69,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

2nd speed 1/min: 750  
Charge press. hPa: 1000

TD travel mm: -  
mm: (3,3...4,7)  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 4,9...5,7  
mm: (4,6...6,0)

#### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3,9...4,5  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6,5...7,1

#### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm3/10s: (40...153)

#### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 350  
Del.quantity cm3/: 82,0...83,0  
1000H.: (79,5...85,5)  
2nd speed 1/min: 1260  
Charge press. hPa: 1000  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
3rd speed 1/min: 1250  
Charge press. hPa: 1000  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1220  
Charge press. hPa: 1000  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
5th speed 1/min: 1170  
Charge press. hPa: 1000  
Del.quantity cm3/: -  
1000H.: (61,0...71,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del.quantity cm3/: 77,5...80,5  
1000H.: (76,0...82,0)  
7th speed 1/min: 1000  
Charge press. hPa: 1000  
Del.quantity cm3/: 80,0...83,0  
1000H.: (78,5...84,5)  
8th speed 1/min: 850

Charge press. hPa: 1000  
Del.quantity cm3/: -  
1000H.: (83,0...89,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del.quantity cm3/: 90,0...98,0  
1000H.: (89,0...99,0)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: -  
1000H.: (64,0...70,0)

#### Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

#### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 350  
Del.quantity cm3/: 26,0...34,0  
1000H.: (25,0...35,0)  
2nd speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
3rd speed 1/min: 450  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

#### Automatic starting fuel delivery:

1st speed 1/min: 130  
Charge press. hPa: -  
Del.quantity cm3/: -  
ind. 1000H.: 65,0  
2nd speed 1/min: 240  
Charge press. hPa: -  
Del.quantity cm3/: -  
ax. 1000H.: 65,0

#### Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

#### Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,1...5,4  
MS mm : 1,2...1,45  
SVS max. mm : 2,2

Remarks:



Correction at adjusting nut (46)

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## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 5,8 B3  
Edition : 29.06.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1300 L73  
Type number : D 460 426 020  
  
Customer-specific information  
Customer : PERKINS  
  
Engine : T6.354.4

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0,35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 020  
  
Opening  
pressure bar : 172...175  
  
Perforated-plate  
diameter mm : 0,6  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC):  $\pm 0,02$  (0,04)

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 600  
Charge press. hPa: -  
Setting value mm: 3,1...3,5

Supply-pump pressure:

Speed 1/min: 600  
Charge press. hPa: -

B16

Setting value bar: 3,4...4,0

Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 95,5...96,5  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 91,5...92,5

Low-idle speed regulation:

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000H.: 10,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: 3,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1480  
Charge press. hPa: 750  
Del. quantity cm<sup>3</sup>/  
1000H.: 42,0...48,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 100,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: -  
TD travel mm: 0,4...1,2  
mm: (0,1...1,5)  
  
2nd speed 1/min: 600  
Charge press. hPa: -  
TD travel mm: -  
mm: (2,6...4,0)  
  
3rd speed 1/min: 800  
Charge press. hPa: -  
TD travel mm: 3,6...4,4  
mm: (3,3...4,7)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Charge press. hPa: -

Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 600  
Charge press. hPa: -  
Supply-pump  
pressure bar: 3,1...3,5  
3rd speed 1/min: 1300  
Charge press. hPa: -  
Supply-pump  
pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1300  
Charge press. hPa: -  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting  
point hPa: 320  
LDA stroke mm: 3,5  
Del. quantity cm3/: 92,5...94,5  
1000H.: (39,8...97,2)  
2nd speed 1/min: 1550  
Charge press. hPa: 750  
Del. quantity cm3/: 5,0...13,0  
1000H.: (4,0...14,0)  
3rd speed 1/min: 1480  
Del. quantity cm3/: -  
1000H.: (40,0...50,0)  
4th speed 1/min: 1300  
Charge press. hPa: 750  
Del. quantity cm3/: 89,0...92,0  
1000H.: (87,5...93,5)  
5th speed 1/min: 1000  
Charge press. hPa: -  
Del. quantity cm3/: -  
1000H.: (89,0...95,0)  
6th speed 1/min: 1000  
Charge press. hPa: 750  
Del. quantity cm3/: -  
1000H.: (93,0...99,0)  
7th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm3/: 88,0...92,0  
1000H.: (86,3...93,7)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1300  
Del. quantity cm3/: -  
1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 300  
Del. quantity cm3/: -  
1000H.: (7,0...17,0)  
2nd speed 1/min: 350  
Del. quantity cm3/: 0,0...1,0  
1000H.: -  
3rd speed 1/min: 400  
Del. quantity cm3/: 0,0...1,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del. quantity cm3/: -  
ind. 1000H.: 85,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,3
MS	mm	:	1,1...1,3
SVS max.	mm	:	6,0
XK	mm	:	20,2...22,2
XL	mm	:	10,6...13,9

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 5,6 K  
Edition : 30.06.87  
replaces : 09.83  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1400 R120  
Type number : O 460 426 028

Customer-specific information  
Customer : MAN

Engine : D 0226 MK/170

Power k: 125  
Speed 1/mi: 2800

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2  
(from BDC) :  $\pm 0,02$  (0,04)

Injection-pump setting values  
Test specifications in parentheses

### Timing-device travel:

Speed 1/min: 630  
Charge press. hPa: 1000  
Setting value mm: 3,2...3,6

### Supply-pump pressure:

Speed 1/min: 630  
Charge press. hPa: 1000

Setting value bar: 5,6...6,2

### Full-load del. with charge press.:

Speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 106,5...107,5  
Dispersion cm<sup>3</sup>/  
1000H : (4,5)

### Full-load del. w/out charge press.:

Speed 1/min : 630  
Del. quantity cm<sup>3</sup>/  
1000H.: 77,5...78,5

### Low-idle speed regulation:

Speed 1/min: 300  
Del. quantity cm<sup>3</sup>/  
1000H.: 10,0...16,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

### Full-load speed regulation:

Speed 1/min: 1440  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H: 87,0...93,0

### Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 80,0

### Load-dependent start of delivery:

Speed 1/min: 630

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1000  
TD travel mm: 2,0...2,8  
mm: (1,7...3,1)  
2nd speed 1/min: 630  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (2,7...4,1)  
3rd speed 1/min: 800  
Charge press. hPa: 1000  
TD travel mm: 4,0...4,8  
mm: (3,7...5,1)

### Supply-pump pressure characteristic:

1st speed 1/min: 400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5,1...5,7  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,5...8,1

### Overflow quantity at overflow valve:

1st speed 1/min: 630  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Overflow : 55...139  
quantity cm<sup>3</sup>/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 630  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 4,5  
Del. quantity cm<sup>3</sup>/: 101,5...102,5  
1000H.: (99,0...105,0)  
2nd speed 1/min: 1620  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0,0...2,0  
1000H.: -  
3rd speed 1/min: 1590  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1540  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 0,0...15,0  
1000H.: -  
5th speed 1/min: 1440  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (85,0...95,0)  
6th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 99,5...102,5  
1000H.: (98,0...104,0)  
7th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (104,0...110,0)  
8th speed 1/min: 800  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/: 102,0...106,0  
1000H.: (100,3...107,7)  
9th speed 1/min: 630  
Charge press. hPa: 1000

Del. quantity cm<sup>3</sup>/: 106,0...110,0  
1000H.: (104,3...111,7)  
10th speed 1/min: 630  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/: 77,5...78,5  
1000H.: (75,0...81,0)

### Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (8,0...18,0)  
2nd speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: 0,0...5,0  
1000H.: -  
3rd speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H.: 80,0  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H.: 85,0

### Mounting and assembly dimensions:

#### Designation

K	mm	:	-
KF	mm	:	5,7...6,0
MS	mm	:	0,7...0,95
SVS max.	mm	:	4,3

#### Remarks:

Correction at adjusting nut (46)

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U2  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO 4113  
Injection pump : VE 6/12F1325 R198  
Type number : 0 460 426 063  
Customer Part-No. : 390 8212

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT-5,9

Power k: 93  
Speed 1/mi: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,5  
mm: +-0,02 (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

B20

Speed 1/min: 850  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 850  
Setting value bar: 3,9...4,5

Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del. quantity cm3/  
1000H.: 56,5...57,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1450  
Del. quantity cm3/  
1000H: 37,0...43,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 50,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 850  
TD travel mm: -  
mm: (3,3...4,7)  
3rd speed 1/min: 1100  
TD travel mm: 5,4...6,2  
mm: (5,1...6,5)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,5...3,1  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1400  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1580  
Del. quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1530  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1490  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1450  
Del. quantity cm3/: -  
1000H.: (36,0...44,0)  
5th speed 1/min: 1400  
Del. quantity cm3/: 53,5...56,5  
1000H.: (52,0...58,0)  
6th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (54,0...60,0)  
7th speed 1/min: 850  
Del. quantity cm3/: 52,5...56,5  
1000H.: (51,5...57,5)  
8th speed 1/min: 500  
Del. quantity cm3/: 39,0...47,0  
1000H.: (38,0...48,0)

Zero delivery (stop):

Mech. shutoff:

Speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (7,0...15,0)  
2nd speed 1/min: 450  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H: 60,0

2nd speed 1/min: 400

Del. quantity cm3/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,4...1,65
SVS max.	mm	:	1,2
XK	mm	:	18,8...20,8
XL	mm	:	9,6...13,0

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 5,6 I1  
Edition : 30.06.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R120-5  
Type number : 0 460 426 074

Customer-specific information  
Customer : MAN

Engine : D 0226 MTXE/51

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,2  
(from BDC):  $\pm 0,02$  (0,04)

Indicator setting:  
Piston stroke mm: 1  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 700  
Charge press. hPa: 1000  
Setting value mm: 2,5...2,9

Supply-pump pressure:

Speed 1/min: 700



Charge press. hPa: 1000  
Setting value bar: 4,5...5,1

Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 93,5...94,5  
Dispersion cm3/ : 4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min : 500  
Del. quantity cm3/  
1000H.: 79,0...80,0

Low-idle speed regulation:

Speed 1/min: 300  
Del. quantity cm3/  
1000H.: 41,0...47,0  
Dispersion cm3/ : 3,5  
1000H.: (4,5)

Full-load speed regulation:

Speed 1/min: 1180  
Charge press. hPa: 1000  
Del. quantity cm3/  
1000H.: 64,0...70,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 80,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
TD travel mm: 0,2...1,0  
mm: (0,0...1,3)  
2nd speed 1/min: 700  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (2,0...3,4)  
3rd speed 1/min: 900  
Charge press. hPa: 1000  
TD travel mm: 3,8...4,6  
mm: (3,5...4,9)  
4th speed 1/min: 1100  
Charge press. hPa: 1000  
TD travel mm: 4,5...5,3  
mm: (4,2...5,6)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3,6...4,2  
2nd speed 1/min: 900  
Charge press. hPa: 1000  
Supply-pump pressure bar: 5,4...6,0  
3rd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 6,3...6,9

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm3/10s: 41...83  
(26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: -  
Overflow quantity cm3/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 600  
Charge-air pressure-setting point hPa: 175  
LDA stroke mm: 5,7  
Del. quantity cm3/ : 90,5...91,5  
1000H.: (88,0...94,0)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm3/ : 0,0...1,5  
1000H.: -  
3rd speed 1/min: 1260  
Charge press. hPa: 1000  
Del. quantity cm3/ : 0,0...15,0  
1000H.: -  
4th speed 1/min: 1220  
Charge press. hPa: 1000  
Del. quantity cm3/ : 0,0...15,0  
1000H.: -  
5th speed 1/min: 1180  
Charge press. hPa: 1000  
Del. quantity cm3/ : -  
1000H.: (62,0...72,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm3/ : 92,5...95,5  
1000H.: (91,0...97,0)  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm3/ : 95,0...99,0  
1000H.: (94,0...100,0)  
8th speed 1/min: 700  
Charge press. hPa: 1000

Del. quantity cm3/: -  
1000H: (91,0...97,0)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm3/: 90,0...94,0  
1000H: (88,3...95,7)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm3/: 79,0...80,0  
1000H: (76,5...82,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: --

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 300  
Del. quantity cm3/: -  
1000H.: (39,0...49,0)  
2nd speed 1/min: 450  
Del. quantity cm3/: 0,0...3,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 320  
Del. quantity cm3/: -  
ind. 1000H: 90,0  
2nd speed 1/min: 440  
Del. quantity cm3/: -  
ax. 1000H: 90,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : 5,7...6,0  
MS mm : 1,0...1,25  
SVS max. mm : 2,5

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U1  
Edition : 07.07.87  
replaces : -  
Calibrating oil : IS04113  
Injection pump : VE 6/12F1100 R225-9  
Type number : 0 460 426 075  
Customer Part-No. : 390 8206

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-590 IND.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0,5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm : 1,5  
mm :  $\pm 0,02$  (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm<sup>3</sup>/  
1000H.: 64,5...65,5  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm<sup>3</sup>/  
1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1100  
Del.quantity cm<sup>3</sup>/  
1000H.: 46,0...52,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1050  
TD travel mm: 5,0...5,8  
mm: (4,7...6,1)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,4...3,0  
2nd speed 1/min: 1050  
Supply-pump  
pressure bar: 4,6...5,2

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del. quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1160  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1130  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (44,0...54,0)  
5th speed 1/min: 1050  
Del. quantity cm3/: 60,5...63,5  
1000H.: (59,0...65,0)  
6th speed 1/min: 900  
Del. quantity cm3/: 62,0...65,0  
1000H.: (60,5...66,5)  
7th speed 1/min: 750  
Del. quantity cm3/: -  
1000H.: (62,0...68,0)  
8th speed 1/min: 500  
Del. quantity cm3/: 64,0...72,0  
1000H.: (63,0...73,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H.: 70,0  
2nd speed 1/min: 350  
Del. quantity cm3/: -  
ax. 1000H.: 70,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	2,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO4113

Injection pump : VE 6/12F1100 R225-9  
Type number : 0 460 426 075  
Customer Part-No. : 390 8208

Customer-specific information  
Customer : CUMMINS

Engine : 6BT-590 1ND.

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm : 1,5  
mm :  $\pm 0,02$  (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

### Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

### Full-load del. w/out charge press.:

Speed 1/min: 750  
Del. quantity cm3/  
1000H.: 64,5...65,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del. quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1100  
Del. quantity cm3/  
1000H.: 46,0...52,0

### Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1050  
TD travel mm: 5,0...5,8  
mm: (4,7...6,1)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,4...3,0  
2nd speed 1/min: 1050  
Supply-pump pressure bar: 4,6...5,2

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del. quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1160  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1130  
Del. quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1100  
Del. quantity cm3/: -  
1000H.: (44,0...54,0)  
5th speed 1/min: 1050  
Del. quantity cm3/: 60,5...63,5  
1000H.: (59,0...65,0)  
6th speed 1/min: 900  
Del. quantity cm3/: 62,0...65,0  
1000H.: (60,5...66,5)  
7th speed 1/min: 750  
Del. quantity cm3/: -  
1000H.: (62,0...68,0)  
8th speed 1/min: 500  
Del. quantity cm3/: 64,0...72,0  
1000H.: (63,0...73,0)

### Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del. quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del. quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del. quantity cm3/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 130  
Del. quantity cm3/: -  
ind. 1000H.: 70,0  
2nd speed 1/min: 350  
Del. quantity cm3/: -  
ax. 1000H.: 70,0

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U4  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R225-13  
Type number : 0 460 426 082  
Customer Part-No. : 390 8200

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT-5,9IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,5  
mm: +-0,02 (0,06)  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 4,3...4,7

### Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,7...4,3

### Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 76,5...77,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1150  
Del.quantity cm3/  
1000H.: 49,5...55,5

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 2,1...2,9  
mm: (1,8...3,2)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 1100  
TD travel mm: 5,8...6,6  
mm: (5,5...6,9)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,6...3,2  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5,1...5,7

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1210  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1170  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1150  
Del.quantity cm3/: -  
1000H.: (47,5...57,5)  
5th speed 1/min: 1100  
Del.quantity cm3/: 67,5...70,5  
1000H.: (66,0...72,0)  
6th speed 1/min: 900  
Del.quantity cm3/: 72,5...75,5  
1000H.: (71,0...77,0)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (74,0...80,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 61,0...69,0  
1000H.: (60,0...70,0)

### Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H.: 85,0  
2nd speed 1/min: 240  
Del.quantity cm3/: -  
ax. 1000H.: 85,0



Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation		
K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 0,9..1,15
SVS max.	mm	: 1,2
XK	mm	: 20,2...22,2
XL	mm	: 10,5...13,9

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U6  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R225-13  
Type number : 0 460 426 082  
Customer Part-No. : 390 8201

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT-590IND

Power k: 105  
Speed 1/mi: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,5  
mm: +-0,02 (0,06)  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,4...3,8

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 74,5...75,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1100  
Del.quantity cm3/  
1000H.: 52,0...58,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,4...2,2  
mm: (1,1...2,5)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1050  
TD travel mm: 4,6...5,4  
mm: (4,3...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,6...3,2  
2nd speed 1/min: 1050  
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del.quantity cm3/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1170  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1130  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: (50,0...60,0)  
5th speed 1/min: 1050  
Del.quantity cm3/: 68,5...71,5  
1000H.: (67,0...73,0)  
6th speed 1/min: 900  
Del.quantity cm3/: 72,0...75,0  
1000H.: (70,5...76,5)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (72,0...78,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 57,0...65,0  
1000H.: (56,0...66,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del.quantity cm3/: -  
ind. 1000H.: 80,0

2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	0,9...1,15
SVS max.	mm	:	2,0
XK	mm	:	20,2...22,2
XL	mm	:	10,5...13,9

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U3  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 6/12F1100 R225-13  
Type number : 0 460 426 082  
Customer Part-No. : 391 0251

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT-5,9IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Start of delivery block  
Piston stroke mm : 1,5  
mm : +-0,02 (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 4,3...4,7

### Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,7...4,3

### Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 76,5...77,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

### Full-load speed regulation:

Speed 1/min: 1150  
Del.quantity cm3/  
1000H.: 49,5...55,5

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 2,1...2,9  
mm: (1,8...3,2)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 1100  
TD travel mm: 5,8...6,6  
mm: (5,5...6,9)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,6...3,2  
2nd speed 1/min: 1100  
Supply-pump  
pressure bar: 5,1...5,7

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1100  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 1250  
Del.quantity cm3/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 1210  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1170  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1150  
Del.quantity cm3/: -  
1000H.: (47,5...57,5)  
5th speed 1/min: 1100  
Del.quantity cm3/: 67,5...70,5  
1000H.: (66,0...72,0)  
6th speed 1/min: 900  
Del.quantity cm3/: 72,5...75,5  
1000H.: (71,0...77,0)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (74,0...80,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 61,0...69,0  
1000H.: (60,0...70,0)

### Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 130  
Del.quantity cm3/: -  
ind. 1000H: 85,0  
2nd speed 1/min: 240  
Del.quantity cm3/: -  
ax. 1000H: 85,0

Shutoff electromagnet:

Cut-in

min. voltage : 20,0

Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K mm : -

KF mm : 5,1...5,4

MS mm : 0,9...1,15

SVS max. mm : 1,2

XK mm : 20,2...22,2

XL mm : 10,5...13,9

Remarks:

# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U5  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1100 R225-13  
Type number : 0 460 426 082  
Customer Part-No. : 391 0252

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT-590IND

Power k: 105  
Speed 1/mi: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,5  
mm: +-0,02 (0,06)  
Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:



Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,4...3,8

Full-load del. w/out charge press.:

Speed 1/min : 750  
Del.quantity cm3/  
1000H.: 74,5...75,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: -  
1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1100  
Del.quantity cm3/  
1000H: 52,0...58,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,4...2,2  
mm: (1,1...2,5)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1050  
TD travel mm: 4,6...5,4  
mm: (4,3...5,7)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump  
pressure bar: 2,6...3,2  
2nd speed 1/min: 1050  
Supply-pump  
pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (25...98)  
2nd speed 1/min: 1050  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1200  
Del.quantity cm3/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1170  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1130  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: (50,0...60,0)  
5th speed 1/min: 1050  
Del.quantity cm3/: 68,5...71,5  
1000H.: (67,0...73,0)  
6th speed 1/min: 900  
Del.quantity cm3/: 72,0...75,0  
1000H.: (70,5...76,5)  
7th speed 1/min: 750  
Del.quantity cm3/: -  
1000H.: (72,0...78,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 57,0...65,0  
1000H.: (56,0...66,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 450  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del.quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 250  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 0,9...1,15
SVS max.	mm	: 2,0
XK	mm	: 20,2...22,2
XL	mm	: 10,5...13,9

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PER 6,0 D  
Edition : 20.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1300 R240  
Type number : 0 460 426 084

Customer-specific information  
Customer : PERKINS

Engine : T6 60 CC

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 020

Opening  
pressure bar : 172...175

Perforated-plate  
diameter mm : 0.6

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,25  
(from BDC): +-0,02 (0,04)

Indicator setting:  
Piston stroke mm: 1.0  
Outlet : A

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value mm: 1,8...2,2

### Supply-pump pressure:

Speed 1/min: 1200  
Charge press. hPa: 1000  
Setting value bar: 6,9...7,5

### Full-load del. with charge press.:

Speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 96,0...97,0  
Dispersion cm<sup>3</sup> : 5,0  
1000H.: (5,0)

### Full-load del. w/out charge press.:

Speed 1/min : 700  
Del. quantity cm<sup>3</sup>/  
1000H.: 87,0...88,0

### Low-idle speed regulation:

Speed 1/min: 300  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 16,5...20,5  
Dispersion cm<sup>3</sup> : 5,0  
1000H.: (5,0)

### Full-load speed regulation:

Speed 1/min: 1450  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 47,0...53,0

### Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 120,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 1000  
TD travel mm: 0,3...1,1  
mm: (0,0...1,4)

### KSB solenoid-operated

valve volt: 1200  
Timing valve volt: 1000  
TD travel mm: -  
mm: (1,3...2,7)

3rd speed 1/min: 1300  
Charge press. hPa: 1000

TD travel mm: 2,0...2,8  
mm: (1,7...3,1)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 3,9...4,5  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Supply-pump pressure bar: 7,3...7,9

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1300  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 450  
Del. quantity cm<sup>3</sup> : 93,0...94,0  
1000H.: (90,5...96,5)  
2nd speed 1/min: 1550  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : 0,0...2,6  
1000H.: -

3rd speed 1/min: 1500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : 16,0...24,0  
1000H.: (13,0...27,0)

4th speed 1/min: 1450  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : -  
1000H.: (44,0...56,0)

5th speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : 75,0...83,0  
1000H.: (72,0...86,0)

6th speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : 94,0...97,0  
1000H.: (92,5...98,5)

7th speed 1/min: 1000  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : 96,5...99,5  
1000H.: (95,0...101,0)

8th speed 1/min: 700  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup> : -  
1000H.: (93,5...99,5)

9th speed 1/min: 700

Charge press. hPa: -  
Del. quantity cm3/: -  
1000H: (84,5...100,5)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del. quantity cm3/: 80,0...83,0  
1000H: (78,5...84,5)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 1300  
Del. quantity cm3/: 0..3  
1000H.: -

Electr. shutoff:  
Speed 1/min: 300  
ELAB volt: -  
Del. quantity cm3/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 300  
Del. quantity cm3/: -  
1000H.: (13,5...23,5)  
2nd speed 1/min: 350  
Del. quantity cm3/: 4,5...10,5  
1000H.: (2,5...12,5)  
3rd speed 1/min: 400  
Del. quantity cm3/: 0,0...3,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 150  
Del. quantity cm3/: -  
ind. 1000H: 95,0  
2nd speed 1/min: 230  
Del. quantity cm3/: -  
ex. 1000H: 85,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : -  
KF mm : K-0T  
MS mm : 0,7...0,95  
SVS max. mm : 3,2

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U/  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R173-5  
Type number : 0 460 426 086  
Customer Part-No. : 390 4545

Customer-specific information  
Customer : CUMMINS

Engine : 6 BTA 590IND

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) : +-0,02 (0,04)

Start of delivery block  
Piston stroke mm : 1,85  
mm : +-0,02 (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000

Setting value mm: 1,3...1,7

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3,3...3,9

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 82,5...83,5  
Dispersion cm<sup>3</sup>/1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000H.: 67,5...68,5

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 60,0...66,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (0,8...2,2)  
3rd speed 1/min: 1100

Charge press. hPa: 1000  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2,3...2,9  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4,7...5,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
Del. quantity cm<sup>3</sup>/1000H.: 77,5...78,5  
1000H.: (75,0...81,0)  
2nd speed 1/min: 1260  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...3,0  
3rd speed 1/min: 1240  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
4th speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
5th speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: (58,0...68,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 78,0...81,0  
78,5...82,5  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 79,5...82,5  
78,0...84,0  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: (80,0...86,0)

9th speed 1/min: 500  
Charge press. hPa: 1000  
Del.quantity cm3/: 79,0...87,0  
1000H: (78,0...88,0)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: -  
1000H: (65,0...71,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 280  
Charge press. hPa: -  
Del.quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 380  
Charge press. hPa: -  
Del.quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 20,0  
Rated voltage : 24,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,1...1,35
SVS max.	mm	:	5,8
XK	mm	:	18,8...20,8
XL	mm	:	11,6...15,0

Remarks:



# BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 U8  
Edition : 08.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1150 R173-S  
Type number : 0 460 426 086  
Customer Part-No. : 390 4727

Customer-specific information  
Customer : CUMMINS

Engine : 6 BTA 590IND

## TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC) :  $\pm 0,02$  (0,04)

Start of delivery block  
Piston stroke mm : 1,85  
mm :  $\pm 0,02$  (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000

Setting value mm: 1,3...1,7

Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3,3...3,9

Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 82,5...83,5  
Dispersion cm<sup>3</sup>/1000H.: 4,0  
1000H.: (4,5)

Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/1000H.: 67,5...68,5

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 8,0...14,0  
Dispersion cm<sup>3</sup>/1000H.: 5,5

Full-load speed regulation:

Speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 60,0...66,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/1000H.: 70,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0,1...0,9  
mm: (0,0...1,2)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (0,8...2,2)  
3rd speed 1/min: 1100

Charge press. hPa: 1000  
TD travel mm: 2,2...3,0  
mm: (1,9...3,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2,3...2,9  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Supply-pump pressure bar: 4,7...5,3

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow quantity cm<sup>3</sup>/10s: 41...83  
(26...98)  
2nd speed 1/min: 1100  
Charge press. hPa: 1000  
Overflow quantity cm<sup>3</sup>/10s: 55...138  
(40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 400  
Del. quantity cm<sup>3</sup>/1000H.: 77,5...78,5  
(75,0...81,0)  
2nd speed 1/min: 1260  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...3,0  
3rd speed 1/min: 1240  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
4th speed 1/min: 1200  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 0,0...15,0  
5th speed 1/min: 1150  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: (58,0...68,0)  
6th speed 1/min: 1100  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 78,0...81,0  
(76,5...82,5)  
7th speed 1/min: 900  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: 79,5...82,5  
(78,0...84,0)  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/1000H.: (80,0...86,0)

9th speed 1/min: 500  
Charge press. hPa: 1000  
Del.quantity cm3/: 79,0...87,0  
1000H: (78,0...88,0)  
10th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: -  
1000H: (65,0...71,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 280  
Charge press. hPa: -  
Del.quantity cm3/: -  
ind. 1000H: 80,0

2nd speed 1/min: 380  
Charge press. hPa: -  
Del.quantity cm3/: -  
ax. 1000H: 80,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,1...1,35
SVS max.	mm	:	2,8
XK	mm	:	18,8...20,8
XL	mm	:	11,6...15,0

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 S7  
Edition : 20.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R225-14  
Type number : 0 460 426 092

Customer-specific information  
Customer : CUMMINS

Engine : 6 BT-5.9

Power k: 96  
Speed 1/mi: 2500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,5  
mm: +-0,02 (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Setting value mm: 3,4...3,8

Supply-pump pressure:

Speed 1/min: 750  
Setting value bar: 3,5...4,1

Full-load del. w/out charge press.:

Speed 1/min : 1100  
Del.quantity cm3/  
1000H.: 60,5...61,5  
Dispersion cm3/: 4,0  
1000H.: (4,5)

Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 8,0...14,0  
Dispersion cm3/: 5,5  
1000H.: -

Full-load speed regulation:

Speed 1/min: 1300  
Del.quantity cm3/  
1000H.: 44,0...50,0

Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 60,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 500  
TD travel mm: 1,5...2,3  
mm: (1,2...2,6)  
2nd speed 1/min: 750  
TD travel mm: -  
mm: (2,9...4,3)  
3rd speed 1/min: 1100  
TD travel mm: 5,2...6,0  
mm: (4,9...6,3)

Supply-pump pressure characteristic:

1st speed 1/min: 500  
Supply-pump pressure bar: 2,4...3,0  
2nd speed 1/min: 1100  
Supply-pump pressure bar: 4,9...5,5

Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 1250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1450  
Del.quantity cm3/: 0,0...3,0  
1000H.: -  
2nd speed 1/min: 1370  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
3rd speed 1/min: 1330  
Del.quantity cm3/: 0,0...15,0  
1000H.: -  
4th speed 1/min: 1300  
Del.quantity cm3/: -  
1000H.: (42,0...52,0)  
5th speed 1/min: 1250  
Del.quantity cm3/: 57,8...60,8  
1000H.: (56,3...62,3)  
6th speed 1/min: 1100  
Del.quantity cm3/: -  
1000H.: (58,0...64,0)  
7th speed 1/min: 750  
Del.quantity cm3/: 58,5...62,5  
1000H.: (56,8...64,2)  
8th speed 1/min: 500  
Del.quantity cm3/: 51,0...59,0  
1000H.: (50,0...60,0)

Zero delivery (stop):

Electr. shutoff:

Speed 1/min: 375  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (6,0...16,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 270  
Del.quantity cm3/: -  
ind. 1000H: 55,0  
2nd speed 1/min: 450

Del. quantity cm3/: -  
ax. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,1...5,4
MS	mm	:	1,3...1,55
SVS max.	mm	:	1,6
XK	mm	:	20,2...22,2
XL	mm	:	10,8...14,2

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : CUM 5,9 L4  
Edition : 14.07.87  
replaces : 11.12.86  
Calibrating oil : ISO 4113

Injection pump : VE 6/12F1250 R173-8  
Type number : 0 460 426 101

Customer-specific information  
Customer : CUMMINS

Engine : 6BTA-5,9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 027

Opening  
pressure bar : 250...253

Perforated-plate  
diameter mm : 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,04)

Start of delivery block  
Piston stroke mm: 1,85  
mm: +-0,02 (0,06)

Outlet : D

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value mm: 1,4...1,8

### Supply-pump pressure:

Speed 1/min: 750  
Charge press. hPa: 1000  
Setting value bar: 3,2...3,8

### Full-load del. with charge press.:

Speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 83,0...84,0  
Dispersion cm<sup>3</sup>/  
1000H.: (4,5)

### Full-load del. w/out charge press.:

Speed 1/min: 500  
Del. quantity cm<sup>3</sup>/  
1000H.: 40,0...41,0

### Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 6,0...12,0

### Full-load speed regulation:

Speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 63,0...69,0

### Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 70,0

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 600  
Charge press. hPa: 1000  
TD travel mm: 0,4...1,2  
mm: (0,1...1,5)  
2nd speed 1/min: 750  
Charge press. hPa: 1000  
TD travel mm: -  
mm: (0,9...2,3)  
3rd speed 1/min: 1050  
Charge press. hPa: 1000  
TD travel mm: 2,3...3,1  
mm: (2,0...3,4)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2,1...2,7  
2nd speed 1/min: 1050  
Charge press. hPa: 1000  
Supply-pump pressure bar: 2,3...3,1

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 1250  
Charge press. hPa: 1000  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 700  
Charge-air pressure-setting point hPa: 450  
Del. quantity cm<sup>3</sup>/  
1000H.: 67,0...68,0  
(64,5...70,5)  
2nd speed 1/min: 1400  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: -  
3rd speed 1/min: 1370  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0,0...15,0  
4th speed 1/min: 1330  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 0,0...15,0  
5th speed 1/min: 1300  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (61,0...71,0)  
6th speed 1/min: 1250  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 74,5...77,5  
(73,0...79,0)  
7th speed 1/min: 1050  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 79,0...82,0  
(77,5...83,5)  
8th speed 1/min: 750  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: (80,5...86,5)  
9th speed 1/min: 500  
Charge press. hPa: 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 83,0...91,0  
(82,0...92,0)



10th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: -  
1000H: (37,5...43,5)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 375  
Del.quantity cm3/: -  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (4,0...14,0)  
2nd speed 1/min: 500  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del.quantity cm3/: -  
ind. 1000H: 60,0

2nd speed 1/min: 370  
Del.quantity cm3/: -  
ex. 1000H: 60,0

Shutoff electromagnet:

Cut-in  
min. voltage : -  
Rated voltage : -

Mounting and assembly dimensions:

Designation

K	mm	: -
KF	mm	: 5,1...5,4
MS	mm	: 1,3...1,55
SVS max.	mm	: 2,2
XK	mm	: 18,8...20,8
XL	mm	: 12,9...16,3

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 A  
Edition : 29.06.87  
replaces : 10.12.86  
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2250 R84  
Type number : 0 460 494 079

Customer-specific information  
Customer : PEUGEOT

Engine : XD3 505D

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 5,0...5,6

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm3/  
1000H.: 37,5...38,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

D01

Low-idle speed regulation:

Speed 1/min: 400  
Del. quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2325  
Del. quantity cm3/  
1000H.: 25,5...31,5

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 45,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 2000  
TD travel mm: 8,1...8,9  
mm: (7,8...9,2)

Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump  
pressure bar: 3,0...3,6  
2nd speed 1/min: 2200  
Supply-pump  
pressure bar: 7,5...8,1

Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:  
1st speed 1/min: 2550

Del. quantity cm<sup>3</sup>/: 0,0...2,0  
1000H.: -  
2nd speed 1/min: 2450  
Del. quantity cm<sup>3</sup>/: 4,5...12,5  
1000H.: (4,5...12,5)  
3rd speed 1/min: 2325  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (24,5...32,5)  
4th speed 1/min: 2200  
Del. quantity cm<sup>3</sup>/: 39,0...41,0  
1000H.: (37,8...42,2)  
5th speed 1/min: 2000  
Del. quantity cm<sup>3</sup>/: 38,5...40,5  
1000H.: (37,3...41,7)  
6th speed 1/min: 1500  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (35,8...40,2)  
7th speed 1/min: 600  
Del. quantity cm<sup>3</sup>/: 35,5...38,5  
1000H.: (34,0...40,0)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: -  
Del. quantity cm<sup>3</sup>/: -  
1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 400  
Del. quantity cm<sup>3</sup>/: -  
1000H.: (4,0...12,0)  
2nd speed 1/min: 440  
Del. quantity cm<sup>3</sup>/: 0,0...2,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 350  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 45,0  
2nd speed 1/min: 450  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 45,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : K1  
KF mm : 5,4...5,7  
MS mm : 1,0...1,25

SVS max. mm : 4,0

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SOF 2,5 G  
Edition : 06.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/ 9F2100 R22-5  
Type number : O 460 494 109  
  
Customer-specific information  
Customer : SOFIM  
  
Engine : 8140.61.200

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0,35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 000  
  
Opening  
pressure bar : 147...150  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Start of delivery  
Prestroke mm : 0,3  
(from BDC): +-0,02 (0,03)  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1800  
Setting value mm: 7,4...7,8  
  
Supply-pump pressure:  
  
Speed 1/min: 1800  
Setting value bar: 6,3...6,9  
  
Full-load del. w/out charge press.:  
  
Speed 1/min : 2000

Del. quantity cm3/  
1000H.: 37,5...38,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

Low-idle speed regulation:

Speed 1/min: 370  
Del. quantity cm3/  
1000H.: 8,0...12,0  
Dispersion cm3/: 2,0  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2350  
Del. quantity cm3/  
1000H.: 19,0...25,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 55,0

Load-dependent start of delivery:

Speed 1/min: 1800

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 400  
TD travel mm: 1,8...2,8  
mm: (1,6...3,0)  
2nd speed 1/min: 1800  
TD travel mm: -  
mm: (6,9...8,3)  
3rd speed 1/min: 2100  
TD travel mm: 8,4...9,2  
mm: (8,1...9,5)

Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump pressure bar: 2,9...3,5  
2nd speed 1/min: 2100  
Supply-pump pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2100

Overflow : 55...138  
quantity cm3/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 2500  
Del. quantity cm3/: 0,0...4,5  
1000H.: -  
2nd speed 1/min: 2350  
Del. quantity cm3/: -  
1000H.: (18,0...16,0)  
3rd speed 1/min: 2100  
Del. quantity cm3/: 36,7...39,3  
1000H.: (35,8...40,2)  
4th speed 1/min: 2000  
Del. quantity cm3/: -  
1000H.: (35,8...40,2)  
5th speed 1/min: 1100  
Del. quantity cm3/: 43,5...46,5  
1000H.: (42,8...47,2)  
6th speed 1/min: 600  
Del. quantity cm3/: 35,3...38,3  
1000H.: (33,8...39,8)

Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2100  
Del. quantity cm3/: -  
1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 370  
Del. quantity cm3/: -  
1000H.: (6,0...14,0)  
2nd speed 1/min: 420  
Del. quantity cm3/: 0,0...1,5  
1000H.: -  
3rd speed 1/min: 500  
Del. quantity cm3/: 0,0...3,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400  
Del. quantity cm3/: -  
ind. 1000H.: 37,0  
2nd speed 1/min: 480  
Del. quantity cm3/: 32,0...38,0  
ax. 1000H.: -

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	:	-
KF	mm	:	5,4...5,7
MS	mm	:	1,7..1,95
SVS max.	mm	:	2,6

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 2,5 A1  
Edition : 30.06.87  
replaces : 10.12.86  
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2250 R84-1  
Type number : 0 460 494 125

Customer-specific information  
Customer : PEUGEOT

Engine : XD3 505D

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 4,0...4,4

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 5,0...5,6

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm3/  
1000H.: 37,5...38,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 400  
Del.quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Full-load speed regulation:

Speed 1/min: 2325  
Del.quantity cm3/  
1000H.: 25,5...31,5

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 45,0

### Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 700  
TD travel mm: 0,6...1,4  
mm: (0,3...1,7)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (3,5...4,9)  
3rd speed 1/min: 2000  
TD travel mm: 8,1...8,9  
mm: (7,8...9,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 700  
Supply-pump pressure bar: 3,0...3,6  
2nd speed 1/min: 2200  
Supply-pump pressure bar: 7,5...8,1

### Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 2550

Del.quantity cm3/: 0,0...2,0

1000H.: -

2nd speed 1/min: 2450

Del.quantity cm3/: 4,5...12,5  
1000H.: (4,5...12,5)

3rd speed 1/min: 2325

Del.quantity cm3/: -  
1000H.: (24,5...32,5)

4th speed 1/min: 2200

Del.quantity cm3/: 39,0...41,0  
1000H.: (37,8...42,2)

5th speed 1/min: 2000

Del.quantity cm3/: 38,5...40,5  
1000H.: (37,3...41,7)

6th speed 1/min: 1500

Del.quantity cm3/: -  
1000H.: (35,8...40,2)

7th speed 1/min: 600

Del.quantity cm3/: 35,5...38,5  
1000H.: (34,0...40,0)

### Zero delivery (stop):

#### Mech. shutoff:

Speed 1/min: -  
Del.quantity cm3/: -  
1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 400  
Del.quantity cm3/: -  
1000H.: (4,0...12,0)  
2nd speed 1/min: 440  
Del.quantity cm3/: 0,0...2,0  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 350  
Del.quantity cm3/: -  
ind. 1000H.: 45,0

2nd speed 1/min: 450  
Del.quantity cm3/: -  
ax. 1000H.: 45,0

### Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

### Mounting and assembly dimensions:

#### Designation

K mm : K1  
KF mm : 5,4...5,7  
MS mm : 1,2...1,45



SVS max. mm : 4,0

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W3  
Edition : 07.07.87  
replaces : 03.84  
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2250 R149  
Type number : O 460 494 138

Customer-specific information  
Customer : VW

Engine : 086T

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value bar: 4,6...5,2

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 750

Del. quantity cm3/  
1000H.: 43,5...44,5  
Dispersion cm3/ : 2,5  
1000H.: (3,0)

Full-load del. w/out charge press.:

Speed 1/min: 600  
Del. quantity cm3/  
1000H.: 23,5...24,5

Low-idle speed regulation:

Speed 1/min: 475  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 6,0...10,0  
Dispersion cm3/ : 2,0  
1000H.: (3,0)

Full-load speed regulation:

Speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm3/  
1000H.: 10,0...14,0

Start:

Speed 1/min: 100  
Charge press. hPa: -  
Del. quantity : -  
mind cm3/1000H.: 35,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 750  
TD travel mm: 1,8...2,6  
mm: (1,5...2,9)  
2nd speed 1/min: 1500  
Charge press. hPa: 750  
TD travel mm: -  
mm: (3,3...4,7)  
3rd speed 1/min: 2250  
Charge press. hPa: 750  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 750  
Supply-pump  
pressure bar: 2,5...3,1  
2nd speed 1/min: 2250  
Charge press. hPa: 750

Supply-pump  
pressure bar: 6,5...7,1

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Charge press. hPa: -  
Overflow : 55...70  
quantity cm3/10s: (50...75)  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Overflow : 82...112  
quantity cm3/10s: (77...117)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting  
point hPa: 300  
LDA stroke mm: 4,0  
Del. quantity cm3/ : 33,5...34,5  
1000H.: (31,0...37,0)  
2nd speed 1/min: 2750  
Charge press. hPa: 750  
Del. quantity cm3/ : 0,0...3,0  
1000H.: -  
3rd speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm3/ : -  
1000H.: (8,0...16,0)  
4th speed 1/min: 2425  
Charge press. hPa: 750  
Del. quantity cm3/ : 22,0...32,0  
1000H.: (21,0...33,0)  
5th speed 1/min: 2250  
Charge press. hPa: 750  
Del. quantity cm3/ : 37,5...39,5  
1000H.: (36,3...40,7)  
6th speed 1/min: 1500  
Charge press. hPa: 750  
Del. quantity cm3/ : -  
1000H.: (41,8...46,2)  
7th speed 1/min: 600  
Charge press. hPa: -  
Del. quantity cm3/ : -  
1000H.: (21,0...27,0)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 475  
ELAB volt: -  
Del. quantity cm3/ : 0,0...3,0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 475  
Del. quantity cm3/ : -  
1000H.: (4,0...12,0)

2nd speed 1/min: 1200  
Del.quantity cm3/: 0,0...4,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 400  
Charge press. hPa: -  
Del.quantity cm3/: -  
ind. 1000H: 22,0

2nd speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,2...1,45  
SVS max. mm : 3,8  
XK mm : 18,4...20,4  
XL mm : 8,6...12,0

Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 X2  
Edition : 17.07.87  
replaces : 02.04.87  
Calibrating oil : ISO 4113  
Injection pump : VE 4/ 9F2250 R211  
Type number : 0 460 494 172

Customer-specific information  
Customer : VW

Engine : 086-1,6L. LLK

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value mm: 3,8...4,2

Supply-pump pressure:

Speed 1/min: 1500  
Charge press. hPa: 750  
Setting value bar: 4,9...5,5

Full-load del. with charge press.:

Speed 1/min: 1500  
Charge press. hPa: 750

Del. quantity cm3/  
1000H.: 41,5...42,5  
Dispersion cm3/ : 2,5  
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 1500  
Del. quantity cm3/  
1000H.: 34,3...37,3

Low-idle speed regulation:

Speed 1/min: 400  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 9,0...11,0  
Dispersion cm3/ : 2,5  
1000H.: (3,0)

Residual-Delivery Setting

Speed 1/min: 550  
Charge press. hPa: -  
Del. quantity cm3/  
1000H.: 2,5...3,5

Full-load speed regulation:

Speed 1/min: 2525  
Charge press. hPa: 750  
Del. quantity cm3/  
1000H: 7,0...13,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm3/1000H.: 35,0

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 750  
TD travel mm: 1,8...2,6  
mm: (1,5...2,9)

2nd speed 1/min: 1500  
Charge press. hPa: 750  
TD travel mm: -  
mm: (3,3...4,7)

3rd speed 1/min: 1800  
Charge press. hPa: 750  
TD travel mm: 4,8...5,6  
mm: (4,5...5,9)

4th speed 1/min: 2250  
Charge press. hPa: 750  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 500  
Charge press. hPa: 750  
Supply-pump pressure bar: 2,0...2,6  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Supply-pump pressure bar: 7,0...7,6

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Charge press. hPa: -  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250  
Charge press. hPa: 750  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 900  
Charge-air pressure-setting point hPa: 300  
LDA stroke mm: 6,0  
Del.quantity cm3/: 32,5...33,5  
1000H.: (30,0...36,0)  
2nd speed 1/min: 2650  
Charge press. hPa: 750  
Del.quantity cm3/: 0,0...6,0  
1000H.: -  
3rd speed 1/min: 2525  
Charge press. hPa: 750  
Del.quantity cm3/: -  
1000H.: (6,0...14,0)  
4th speed 1/min: 2425  
Charge press. hPa: 750  
Del.quantity cm3/: 21,5...31,5  
1000H.: (20,5...32,5)  
5th speed 1/min: 2250  
Charge press. hPa: 750  
Del.quantity cm3/: 35,5...37,5  
1000H.: (34,3...38,7)  
6th speed 1/min: 1500  
Charge press. hPa: -  
Del.quantity cm3/: -  
1000H.: (32,8...38,8)  
7th speed 1/min: 1500  
Charge press. hPa: 750  
Del.quantity cm3/: -  
1000H.: (39,8...44,2)  
8th speed 1/min: 500  
Charge press. hPa: -  
Del.quantity cm3/: 23,5...24,5  
1000H.: (21,0...27,0)  
9th speed 1/min: 500  
Charge press. hPa: 750

Del.quantity cm3/: 31,0...34,0  
1000H.: (29,5...35,5)

### Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm3/: 0,0...3,0  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 400  
Del.quantity cm3/: -  
1000H.: (4,5...15,5)  
2nd speed 1/min: 425  
Del.quantity cm3/: 5,0...9,0  
1000H.: (1,5...12,5)  
High Idle:  
Speed 1/min: 525  
Del.quantity cm3/: 7,0...9,0  
1000H.: (3,0...13,0)

### Residual:

Speed 1/min: 500  
Del.quantity : 1,0...3,0  
1000H.: (0,0...5,5)

### Automatic starting fuel delivery:

1st speed 1/min: 150  
Del.quantity cm3/: -  
ind. 1000H: 35,0  
2nd speed 1/min: 350  
Del.quantity cm3/: -  
ax. 1000H: 30,0

### Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

### Mounting and assembly dimensions:

#### Designation

K	mm	: K1
KF	mm	: 5,7...6,0
MS	mm	: 1,2...1,45
SVS max.	mm	: 2,8

#### Remarks:

Correction at adjusting nut (46)

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 X5  
Edition : 17.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/ 9F2250 R254  
Type number : 0 460 494 200  
  
Customer-specific information  
Customer : VW  
  
Engine : 086-1,6L

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0,35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 000  
  
Opening  
pressure bar : 147...150  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1250  
Charge press. hPa: 500  
Setting value mm: 2,1...2,5  
  
Supply-pump pressure:  
  
Speed 1/min: 1250  
Charge press. hPa: 500  
Setting value bar: 4,0...4,6  
  
Full-load del. with charge press.:  
  
Speed 1/min: 1000  
Charge press. hPa: 500

Del. quantity cm<sup>3</sup>/  
1000H.: 27,5...28,5  
Dispersion cm<sup>3</sup>/ : 2,5  
1000H : (3,0)

Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del. quantity cm<sup>3</sup>/  
1000H.: 25,3...26,7

Low-idle speed regulation:

Speed 1/min: 375  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 12,0...14,0  
Dispersion cm<sup>3</sup>/ : 2,0  
1000H.: (3,0)

Residual-Delivery Setting

Speed 1/min: 550  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/  
1000H.: 2,5...3,5(+1,5)

Full-load speed regulation:

Speed 1/min: 2475  
Charge press. hPa: 5001  
Del. quantity cm<sup>3</sup>/  
1000H: 11,0...17,0

Start:

Speed 1/min: 100  
Del. quantity : -  
mind cm<sup>3</sup>/1000H.: 35,0

Load-dependent start of delivery:

Speed 1/min: 1250

Inspection-pump test specifications  
Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1000  
Charge press. hPa: 500  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1250  
Charge press. hPa: 500  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 2250  
Charge press. hPa: 500  
TD travel mm: 6,6...7,4  
mm: (6,3...7,7)

Supply-pump pressure characteristic:

1st speed 1/min: 600  
Charge press. hPa: 500  
Supply-pump  
pressure bar: 2,1...2,7  
2nd speed 1/min: 2250  
Charge press. hPa: 500  
Supply-pump  
pressure bar: 6,9...7,5

Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm<sup>3</sup>/10s: (26...98)  
2nd speed 1/min: 2250  
Charge press. hPa: 500  
Overflow : 55...138  
quantity cm<sup>3</sup>/10s: (40...153)

Delivery-quant. and breakaway char.:

1st speed 1/min: 1000  
Charge-air pressure-setting  
point hPa: 225  
Del. quantity cm<sup>3</sup>/ : 26,5...27,5  
1000H.: (24,0...30,0)  
2nd speed 1/min: 2700  
Charge press. hPa: 500  
Del. quantity cm<sup>3</sup>/ : 0,0...6,0  
1000H.: -  
3rd speed 1/min: 2475  
Charge press. hPa: 500  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (10,0...18,0)  
4th speed 1/min: 2400  
Charge press. hPa: 500  
Del. quantity cm<sup>3</sup>/ : 16,0...26,0  
1000H.: (15,0...27,0)  
5th speed 1/min: 1000  
Charge press. hPa: -  
Del. quantity cm<sup>3</sup>/ : -  
1000H.: (23,0...29,0)  
6th speed 1/min: 1000  
Charge press. hPa: 150  
Del. quantity cm<sup>3</sup>/ : 25,3...26,7  
1000H.: (23,0...29,0)  
7th speed 1/min: 1000  
Charge press. hPa: 300  
Del. quantity cm<sup>3</sup>/ : 27,5...28,5  
1000H.: (25,8...30,2)  
8th speed 1/min: 600  
Charge press. hPa: 500  
Del. quantity cm<sup>3</sup>/ : 21,0...24,0  
1000H.: (19,5...25,5)  
9th speed 1/min: 2250  
Charge press. hPa: 500  
Del. quantity cm<sup>3</sup>/ : 27,5...29,5  
1000H.: (26,3...30,7)  
10th speed 1/min: 1000



Charge press. hPa: 500  
Del.quantity cm3/: -  
1000H: (25,8...30,2)

Zero delivery (stop):

Electr. shutoff:  
Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm3/: 0,0...3,0  
max. 1000H.: -

Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (9,0...17,0)  
2nd speed 1/min: 425  
Del.quantity cm3/: 5,5...8,5  
1000H.: (3,0...11,0)

High Idle:  
Speed 1/min: 525  
Del.quantity cm3/: 7,0...9,0  
1000H.: (4,0...12,0)

Residual:  
Speed 1/min: 500  
Del.quantity : 3,2...5,2  
1000H.: (1,7...6,7)

Automatic starting fuel delivery:

1st speed 1/min: 180  
Del.quantity cm3/: -  
ind. 1000H: 35,0

2nd speed 1/min: 380  
Del.quantity cm3/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation  
K mm : 3,2...3,4  
KF mm : 5,7...6,0  
MS mm : 1,3...1,55  
SVS max. mm : -

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 W19  
Edition : 27.07.87  
replaces : 02.04.87  
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2400 R221-2  
Type number : 0 460 494 207

Customer-specific information  
Customer : VW

Engine : 086-1,6L

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 000

Opening  
pressure bar : 147...150

Test inj. tubing : 1 680 750 017

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 2,1...2,5

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 4,0...4,6

Full-load del. w/out charge press.:

Speed 1/min : 1000  
Del.quantity cm3/  
1000H.: 28,5...29,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/ 1000H.: 11,0...13,0  
Dispersion cm3/: 2,0  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del.quantity cm3/ 1000H.: 2,5...3,5  
Full-load speed regulation:

Speed 1/min: 2600  
Del.quantity cm3/ 1000H.: 11,0...17,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 35,0

### Load-dependent start of delivery:

Speed 1/min: 1250

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 1,0...1,8  
mm: (0,7...2,1)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 1800  
TD travel mm: 4,2...5,0  
mm: (3,9...5,3)  
4th speed 1/min: 2400  
TD travel mm: 6,1...6,9  
mm: (5,8...7,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 2,1...2,7  
2nd speed 1/min: 2400  
Supply-pump pressure bar: 7,3...7,9

### Overflow quantity at overflow valve:

1st speed 1/min: 600

Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2400  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 2800  
Del.quantity cm3/: -  
1000H.: 0,0...6,0  
2nd speed 1/min: 2600  
Del.quantity cm3/: -  
1000H.: (10,0...18,0)  
3rd speed 1/min: 2500  
Del.quantity cm3/: 19,0...29,0  
1000H.: (18,0...30,0)  
4th speed 1/min: 2400  
Del.quantity cm3/: 27,5...29,5  
1000H.: (26,3...30,7)  
5th speed 1/min: 1000  
Del.quantity cm3/: -  
1000H.: (26,8...31,2)  
6th speed 1/min: 600  
Del.quantity cm3/: 22,5...25,5  
1000H.: (21,0...27,0)

### Zero delivery (stop):

### Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm3/: 0,0...3,0  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (8,0...16,0)  
2nd speed 1/min: 425  
Del.quantity cm3/: 5,5...8,5  
1000H.: (3,0...11,0)

### High Idle:

Speed 1/min: 525  
Del.quantity cm3/: 7,0...9,0  
1000H.: (4,0...12,0)

### Residual:

Speed 1/min: 500  
Del.quantity : 2,5...4,5  
1000H.: (1,0...6,0)

### Automatic starting fuel delivery:

1st speed 1/min: 180  
Del.quantity cm3/: -  
ind. 1000H.: 35,0  
2nd speed 1/min: 380

Del. quantity cm3/: -  
ax. 1000H: 30,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3...1,55
SVS max.	mm	: 3,1

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VWV 1,6 X5  
Edition : 16.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/ 9F2250 R270  
Type number : 0 460 494 210  
  
Customer-specific information  
Customer : VW  
  
Engine : 086-1,6L

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0,35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 000  
  
Opening  
pressure bar : 147...150  
  
Test inj. tubing : 1 680 750 017  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 840  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1250  
Setting value mm: 2,1...2,5  
  
Supply-pump pressure:  
  
Speed 1/min: 1250  
Setting value bar: 4,0...4,6  
  
Full-load del. w/out charge press.:  
  
Speed 1/min : 1000  
Del.quantity cm3/  
1000H.: 27,5...28,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 11,0...13,0  
Dispersion cm3/: 2,0  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del.quantity cm3/  
1000H.: 2,5...3,5(+1,5)

### Full-load speed regulation:

Speed 1/min: 2475  
Del.quantity cm3/  
1000H.: 11,0...17,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 35,0

### Load-dependent start of delivery:

Speed 1/min: 1250

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 1000  
TD travel mm: 0,9...1,7  
mm: (0,6...2,0)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (1,6...3,0)  
3rd speed 1/min: 2250  
TD travel mm: 6,6...7,4  
mm: (6,3...7,7)

### Supply-pump pressure characteristic:

1st speed 1/min: 600  
Supply-pump pressure bar: 2,1...2,7  
2nd speed 1/min: 2250  
Supply-pump pressure bar: 6,9...7,5

### Overflow quantity at overflow valve:

1st speed 1/min: 600  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2250

Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 2700  
Del.quantity cm3/: 0,0...6,0  
1000H.: -  
2nd speed 1/min: 2475  
Del.quantity cm3/: -  
1000H.: (10,0...18,0)  
3rd speed 1/min: 2400  
Del.quantity cm3/: 16,0...26,0  
1000H.: (15,0...27,0)  
4th speed 1/min: 2250  
Del.quantity cm3/: 26,5...28,5  
1000H.: (25,3...29,7)  
5th speed 1/min: 1000  
Del.quantity cm3/: -  
1000H.: (25,8...30,2)  
6th speed 1/min: 600  
Del.quantity cm3/: 21,0...24,0  
1000H.: (19,5...25,5)

### Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 425  
ELAB volt: -  
Del.quantity cm3/: 0,0...3,0  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (8,0...16,0)  
2nd speed 1/min: 425  
Del.quantity cm3/: 5,5...8,5  
1000H.: (3,0...11,0)  
High Idle:  
Speed 1/min: 525  
Del.quantity cm3/: 7,0...9,0  
1000H.: (4,0...12,0)

### Residual:

Speed 1/min: 500  
Del.quantity : 3,2...5,2  
1000H.: (1,7...6,7)

### Automatic starting fuel delivery:

1st speed 1/min: 180  
Del.quantity cm3/: -  
ind. 1000H.: 35,0  
2nd speed 1/min: 380  
Del.quantity cm3/: -  
ax. 1000H.: 30,0

Shutoff electromagnet:

Cut-in

min. voltage : 10,0

Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K mm : 3,2...3,4

KF mm : 5,7...6,0

MS mm : 1,3...1,55

SVS max. mm : 3,7

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 3,9 C  
Edition : 17.07.87  
replaces : -  
Calibrating oil : ISO 4113  
  
Injection pump : VE 4/ 9F2300 R282  
Type number : 0 460 494 214  
  
Customer-specific information  
Customer : FIAT  
  
Engine : M 705

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50  
  
Inlet press., bar : 0,35  
  
Calibrating nozzle-holder  
assembly : 1 688 901 022  
  
Opening  
pressure bar : 130...133  
  
Test inj. tubing : 1 680 750 073  
  
Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450  
  
Injection-pump setting values  
Test specifications in parentheses  
  
Timing-device travel:  
  
Speed 1/min: 1500  
Setting value mm: 4,3...4,7  
  
Supply-pump pressure:  
  
Speed 1/min: 1500  
Setting value bar: 5,6...6,2  
  
Full-load del. w/out charge press.:  
  
Speed 1/min : 1500  
Del. quantity cm3/  
1000H.: 34,5...35,5  
Dispersion cm3/: 2,5  
1000H.: (3,0)



### Low-idle speed regulation:

Speed 1/min: 390  
Del.quantity cm3/  
1000H.: 9,0...13,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)

### Full-load speed regulation:

Speed 1/min: 2450  
Del.quantity cm3/  
1000H.: 22,0...28,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 55,0

### Load-dependent start of delivery:

Speed 1/min: 1500

Inspection-pump test specifications  
Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 1,7...2,5  
mm: (1,4...2,8)  
2nd speed 1/min: 1500  
TD travel mm: -  
mm: (3,8...5,2)  
3rd speed 1/min: 2300  
TD travel mm: 7,1...7,9  
mm: (6,8...8,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 400  
Supply-pump pressure bar: 2,9...3,4  
2nd speed 1/min: 2300  
Supply-pump pressure bar: 7,4...8,0

### Overflow quantity at overflow valve:

1st speed 1/min: 400  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2300  
Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 2750

Del.quantity cm3/: 0,0...3,5  
1000H.: -

2nd speed 1/min: 2650  
Del.quantity cm3/: 3,5...10,5  
1000H.: (3,0...11,0)

3rd speed 1/min: 2450  
Del.quantity cm3/: -  
1000H.: (22,8...27,2)

4th speed 1/min: 2300  
Del.quantity cm3/: 35,5...38,5  
1000H.: (34,8...39,2)

5th speed 1/min: 1500  
Del.quantity cm3/: -  
1000H.: (32,8...37,2)

6th speed 1/min: 1000  
Del.quantity cm3/: 34,2...36,8  
1000H.: (33,3...37,7)

7th speed 1/min: 600  
Del.quantity cm3/: 36,0...39,0  
1000H.: (34,5...40,5)

### Zero delivery (stop):

Mech. shutoff:  
Speed 1/min: 2300  
Del.quantity cm3/: -  
1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 390  
Del.quantity cm3/: -  
1000H.: (7,0...15,0)  
2nd speed 1/min: 440  
Del.quantity cm3/: 1,0...7,0  
1000H.: (0,0...8,0)  
3rd speed 1/min: 500  
Del.quantity cm3/: 0,0...2,5  
1000H.: -

### Automatic starting fuel delivery:

1st speed 1/min: 300  
Del.quantity cm3/: -  
ind. 1000H.: 45,0  
2nd speed 1/min: 400  
Del.quantity cm3/: -  
ax. 1000H.: 46,0

### Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

### Mounting and assembly dimensions:

### Designation

K	mm	:	3,2...3,4
KF	mm	:	5,7...6,0
MS	mm	:	1,7...1,95
SVS max.	mm	:	2,5

Remarks:

## BOSCH-INJ.-PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : PEU 1,9 D2  
Edition : 07.07.87  
replaces : -  
Calibrating oil : ISO 4113

Injection pump : VE 4/ 9F2300 R162-2  
Type number : 0 460 494 215

Customer-specific information  
Customer : PEUGEOT

Engine : XUD9

### TEST BENCH REQUIREMENTS

Calibrating-oil  
return temp. °C  
with thermometer : 40...48  
electronically : 42...50

Inlet press., bar : 0,35

Calibrating nozzle-holder  
assembly : 1 688 901 022

Opening  
pressure bar : 130...133

Test inj. tubing : 1 680 750 073

Outside diameter : 6  
x Wall thickness : 2  
x Length mm : 450

Injection-pump setting values  
Test specifications in parentheses

Timing-device travel:

Speed 1/min: 1250  
Setting value mm: 3,3...3,7

Supply-pump pressure:

Speed 1/min: 1250  
Setting value bar: 4,2...4,8

Full-load del. w/out charge press.:

Speed 1/min : 1250  
Del. quantity cm<sup>3</sup>/  
1000H.: 29,5...30,5  
Dispersion cm<sup>3</sup>/  
1000H.: (3,0)

### Low-idle speed regulation:

Speed 1/min: 375  
Del.quantity cm3/  
1000H.: 7,0...9,0  
Dispersion cm3/: 2,5  
1000H.: (3,0)  
Residual-Delivery Setting  
Speed 1/min: 550  
Del.quantity cm3/  
1000H.: 2,5...3,5

### Full-load speed regulation:

Speed 1/min: 2400  
Del.quantity cm3/  
1000H.: 20,0...26,0

### Start:

Speed 1/min: 100  
Del.quantity : -  
mind cm3/1000H.: 44,0

### Load-dependent start of delivery:

Speed 1/min: 1250

### Inspection-pump test specifications Test specifications in parentheses

### Timing-device characteristic:

1st speed 1/min: 800  
TD travel mm: 0,4...1,2  
mm: (0,1...1,5)  
2nd speed 1/min: 1250  
TD travel mm: -  
mm: (2,8...4,2)  
3rd speed 1/min: 2000  
TD travel mm: 7,1...7,9  
mm: (6,8...8,2)

### Supply-pump pressure characteristic:

1st speed 1/min: 800  
Supply-pump pressure bar: 3,0...3,6  
2nd speed 1/min: 2000  
Supply-pump pressure bar: 6,3...6,9

### Overflow quantity at overflow valve:

1st speed 1/min: 500  
Overflow : 41...83  
quantity cm3/10s: (26...98)  
2nd speed 1/min: 2300

Overflow : 55...138  
quantity cm3/10s: (40...153)

### Delivery-quant. and breakaway char.:

1st speed 1/min: 2650  
Del.quantity cm3/: 0,0...7,0  
1000H.: -  
2nd speed 1/min: 2500  
Del.quantity cm3/: 10,0...16,0  
1000H.: (9,0...17,0)  
3rd speed 1/min: 2400  
Del.quantity cm3/: -  
1000H.: (19,0...27,0)  
4th speed 1/min: 2250  
Del.quantity cm3/: 29,8...31,8  
1000H.: (28,6...33,0)  
5th speed 1/min: 2000  
Del.quantity cm3/: 30,6...32,6  
1000H.: (29,4...33,8)  
6th speed 1/min: 1250  
Del.quantity cm3/: -  
1000H.: (27,8...32,5)  
7th speed 1/min: 800  
Del.quantity cm3/: 30,5...33,5  
1000H.: (29,0...35,0)  
8th speed 1/min: 500  
Del.quantity cm3/: 29,5...32,5  
1000H.: (28,0...34,0)

### Zero delivery (stop):

#### Electr. shutoff:

Speed 1/min: 2300  
ELAB volt: -  
Del.quantity cm3/: -  
max. 1000H.: -

### Idle delivery:

Mfg. date: until : -  
1st speed 1/min: 375  
Del.quantity cm3/: -  
1000H.: (4,0...12,0)

#### High Idle:

Speed 1/min: 470  
Del.quantity cm3/: 7,0...9,0  
1000H.: (4,0...12,0)

#### Residual:

Speed 1/min: 550  
Del.quantity : -  
1000H.: 0,0...7,0

### Arrangement of drivers on engine- speed lever for exhaust-gas- recirculation valve linkage (guage)

1st speed 1/min: 1125  
Del.quantity cm3/: 17,0...19,0  
1000H.: -

Automatic starting fuel delivery:

1st speed 1/min: 200  
Del. quantity cm<sup>3</sup>/: -  
ind. 1000H: 40,0

2nd speed 1/min: 300  
Del. quantity cm<sup>3</sup>/: -  
ax. 1000H: 35,0

Shutoff electromagnet:

Cut-in  
min. voltage : 10,0  
Rated voltage : 12,0

Mounting and assembly dimensions:

Designation

K	mm	: 3,2...3,4
KF	mm	: 5,7...6,0
MS	mm	: 1,3...1,55
SVS max.	mm	: -
XK	mm	: 17,0...19,0
XL	mm	: 14,2...17,6

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P10  
 Edition : 25.8.87  
 Superseded : -  
 Calibrating oil : ISO 4113  
 Combination no. : 0 400 074 923  
 Injection pump  
 Pump designation : PES4M50C32ORS103-1  
 EP type number : 0 410 054 025  
 Governor  
 Governor design. : RSF375/2200M19-1  
 Governor no. : 0 420 021 065

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM615 -2,0L

1st version kW : 46.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6,00X2,00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1,70...1,80  
 : (1,65...1,85)

Contr.-rod trav.mm: 20,0

Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
 Tolerance + - : 0,00 (1,00)

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 12,00...12,10

Del.quantity cm3/ : 3,1...3,2

100H.: (3,0...3,3)

Dispersion cm3/ : 0,25

100H.: (0,3)

2nd speed 1/min: 375

Contr.-rod trav. m: 6,2...6,4

Del.quantity cm3/ : 0,6...0,7

100H.: (0,5...0,9)

Dispersion cm3/ : 0,1

100H.: (0,15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31,0...32,0

1000H.: (30,0...33,0)

Dispersion cm3/ : 2,5

1000H.: (3,0)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,30...7,70

Speed 1/min : 0...2400

4th speed 1/min : 2950

C-rod trav.mm : 0,00...1,00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,4...1,5

## LOWEST RATED SPEED I

Control-lever

position degrees: 12...16

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 6,3

Testing:

Speed 1/min : 250

C-rod trav.mm min : 11,0

Speed 1/min : 375  
C-rod trav.mm : 6,2...6,4  
C-rod trav.mm : 2,0  
Speed 1/min : 740...840  
Speed 1/min : 1000  
C-rod trav.mm max : 1,50

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 4,80...5,00  
: (4,70...5,10)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 12,00...12,10  
2nd speed 1/min : 1800  
C-rod trav.mm : 11,40...11,60  
3rd speed 1/min : 2100  
C-rod trav.mm : 10,90...11,10

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 32,5...34,0  
1000H.: (31,5...35,0)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)  
Speed 1/min : 2100  
Del.quantity cm3/ : 31,5...33,5  
1000H.: (30,5...34,5)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55,0...0,0  
1000H.: (55,0...0,0)  
Contr.-rod trav.mm: 20,1...0,00

#### HIGH IDLE

Speed 1/min : 2400  
Contr.-rod trav.mm: 7,30...7,70  
Del.quantity cm3/ : 15,0...19,0  
1000H.: (14,0...20,0)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 6,2...6,4  
Del.quantity cm3/ : 6,0...7,0  
1000H.: (5,5...9,0)  
Dispersion cm3/ : 1,00  
1000H.: (1,50)

#### Remarks:

CHECKING THE IDLE-SPEED AUXILIARY

#### SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 375 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,4 V4  
Edition : 26.06.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 074 924  
Injection pump  
Pump designation : PES4M55C32ORS104-1  
EP type number : 0 410 054 963  
Governor  
Governor design. : RSF375/2200M12-1  
Governor no. : 0 420 021 064

Customer-spec. information  
Customer : DB

Engine : OM616 -2.4 l-  
1st version kW : 55.0

## TEST BENCH REQUIREMENTS

Calibrating-pil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 012  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 1.70...1.80  
                  : (1.65...1.85)  
Contr.-rod trav.mm: 20.00...0.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - ° : 0.00 (1.00)

## BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 13.40...13.50  
-----  
Del.quantity cm3/ : 3.7...3.8  
-----  
100H.: (3.6...3.9)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 375.0  
Contr.-rod trav. m: 6.4...6.6  
Del.quantity cm3/ : 0.6...0.7  
100H.: (0.5...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 37.0...38.0  
1000H.: (36.0...39.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,40...7,80  
Speed 1/min : 0...2400  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 1,4...1,5

## LOWEST RATED SPEED I

Control-lever  
position degrees: 8...12  
Setting point w/out aux. spring  
Speed 1/min : 375  
Contr.-rod trav.mm: 6.5

Testing:  
Speed 1/min : 250  
C-rod trav.mm min : 10.50



Speed 1/min : 375  
C-rod trav.mm : 6.40...6.60  
C-rod trav.mm : 2.00  
Speed 1/min : 750...850  
Speed 1/min : 1000  
C-rod trav.mm max : 1.50

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 5.1...5.3  
: (5.0...5.4)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 13.40...13.50  
2nd speed 1/min : 1600  
C-rod trav.mm : 12.90...13.10  
3rd speed 1/min : 2100  
C-rod trav.mm : 12.20...12.40

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1600  
Del.quantity cm3/ : 38.0...39.5  
1000H.: (37.0...41.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2100  
Del.quantity cm3/ : 36.5...38.5  
1000H.: (35.5...39.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 53.0...0.0  
1000H.: (53.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

#### HIGH IDLE

Speed 1/min : 2400  
Contr.-rod trav.mm: 7.40...7.80  
Del.quantity cm3/ : 15.0...19.0  
1000H.: (14.0...20.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 6.40...6.60  
Del.quantity cm3/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### Remarks:

CHECKING THE IDLE-SPEED AUXILIARY

#### SPRING CUTOFF

-Control-lever position 47°. No  
change in control-rod travel after  
switchover point up to 550 1/min,  
control-lever position 30°. Speed  
range 350 1/min...450 1/min.

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 375 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,4 V3  
Edition : 15.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 074 925  
Injection pump  
Pump designation : PES4M55C32ORS107-1  
EP type number : 0 410 054 977  
Governor  
Governor design. : RSF375/2200M18-2  
Governor no. : 0 420 021 058

Customer-spec. information  
Customer : DB

Engine : OM616

1st version kW : 50.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 012

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30  
: (2.15...2.35)

Contr.-rod trav.mm: 18.50...21.50

Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 13.20...13.30

Del.quantity cm3/ : 3.7...3.8

100H.: (3.6...3.9)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 375.0

Contr.-rod trav. m: 6.5...6.7

Del.quantity cm3/ : 0.6...0.7

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 37.0...38.0

1000H.: (36.0...39.0)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 8,20...8,60

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,90...2,00

## LOWEST RATED SPEED I

Control-lever

position degrees: 9...13

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 6.6

Testing:

Speed 1/min : 250

C-rod trav.mm min : 11.00

Speed 1/min : 375  
C-rod trav.mm : 6.50...6.70  
C-rod trav.mm : 2.50  
Speed 1/min : 700...800  
Speed 1/min : 1000  
C-rod trav.mm max : 2.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 450  
Contr.-rod trav.mm: 4.80...5.00  
: (4.70...5.10)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 13.20...13.30  
2nd speed 1/min : 1800  
C-rod trav.mm : 12.60...12.80  
3rd speed 1/min : 2200  
C-rod trav.mm : 12.10...12.30

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 38.0...40.0  
1000H.: (37.0...41.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 38.0...40.0  
1000H.: (37.0...41.0)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 53.0...0.0  
1000H.: (53.0...0.0)  
Contr.-rod trav.mm: 20.30...0.00

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 8.20...8.60  
Del.quantity cm3/ : 20.0...24.0  
1000H.: (19.0...25.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 6.50...6.70  
Del.quantity cm3/ : 6.0...7.0  
1000H.: (5.5...9.0)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

#### Remarks:

CHECKING THE IDLE-SPEED AUXILIARY

#### SPRING CUTOFF

-Control-lever position 47°. No change in control-rod travel after switchover point up to 550 1/min, control-lever position 30°. Speed range 350 1/min...450 1/min.

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 375$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,0 P11  
Edition : 25.8.87  
Superceeded : -  
Calibrating oil : ISO 4113  
Combination no. : 0 400 074 926  
Injection pump  
Pump designation : PES4M55C320RS161  
EP type number : 0 410 054 964  
Governor  
Governor design. : RSF375/2300M56-3  
Governor no. : 0 420 021 056

Customer-spec. information  
Customer : DB

Engine : OM601-LVP

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6,00x2,00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1,50...1,60  
: (1,45...1,65)

Contr.-rod trav.mm: 20,00...22,00

Cam sequence : 1- 3- 4- 2-

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - : 0,00 (1,00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11,3...11,4

Del.quantity cm3/ : 3,10...3,20

100H.: (3,00...3,30)

Dispersion cm3/ : 0,25

100H.: (0,30)

2nd speed 1/min: 375

Contr.-rod trav. m: 5,2...5,4

Del.quantity cm3/ : 0,5...0,6

100H.: (0,4...0,9)

Dispersion cm3/ : 0,1

100H.: (0,15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31,0...32,0

1000H.: (30,0...33,0)

Dispersion cm3/ : 2,5

1000H.: (3,0)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,10...7,50

Speed 1/min : 0,0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0,0...1,0

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 1,9...2,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 375

Contr.-rod trav.mm: 5,3

Testing:

Speed 1/min : 250  
C-rod trav.mm min : 10,0  
Speed 1/min : 375  
C-rod trav.mm : 5,20...5,40

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 400  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11,3...11,4  
2nd speed 1/min : 1800  
C-rod trav.mm : 10,9...11,1  
3rd speed 1/min : 2250  
C-rod trav.mm : 10,3...10,5

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 1000  
Pressure hPa : 930  
Contr.-rod trav.mm: 0,10...0,50

##### Measurement

Speed 1/min : 1000  
1st pressure hPa : 840  
C-rod trav.mm : 1,10...1,30  
2nd pressure hPa : 700  
C-rod trav.mm : 2,30...2,70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34,0...35,5  
1000H.: (33,0...36,5)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)  
Speed 1/min : 2250  
Del.quantity cm3/ : 32,0...34,0  
1000H.: (31,0...35,0)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55,0  
1000H.: (55,0)  
Contr.-rod trav.mm: 20,1

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7,10...7,50

Del.quantity cm3/ : 16,0...20,0  
1000H.: (15,0...21,0)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)

#### LOW IDLE

Speed 1/min : 375  
Contr.-rod trav.mm: 5,2...5,4  
Del.quantity cm3/ : 5,0...6,0  
1000H.: (4,5...9,0)  
Dispersion cm3/ : 1,00  
1000H.: (1,50)

Start-of-delivery spacing (difference)  
between max/min value 1° cam angle  
maximum.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position 46.5°,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 375 1/min. and pu = 450 mbar,  
control rod must move quickly to  
control-rod travel = 0 mm

#### START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock  
after start-of-delivery mean value of  
all cylinders, 18.3...18.7°  
(18.2...18.8°) angular displacement of  
the cam after cylinder 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F7  
Edition : 25.8.87  
Superceeded : -  
Calibrating oil : ISO 4113  
Combination no. : 0 400 075 967  
Injection pump  
Pump designation : PESSM55C32ORS153  
EP type number : 0 410 055 991  
Governor  
Governor design. : RSF340/2300MS9-18  
Governor no. : 0 420 021 078

Customer-spec. information  
Customer : DB

Engine : OM602

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness : 6.00X2.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2,00...2,10  
: (1,95...2,15)

Contr.-rod trav.mm: 20,00...22,00

Cam sequence : 1- 2- 4- 5- 3-

SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11,3...11,4

Del.quantity cm3/ : 3,1...3,2

100H.: (3,0...3,3)

Dispersion cm3/ : 0,25

100H.: (0,30)

2nd speed 1/min: 315

Contr.-rod trav. m: 5,4...5,6

Del.quantity cm3/ : 0,5...0,6

100H.: (0,45...0,90)

Dispersion cm3/ : 0,10

100H.: (0,15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 31,5...32,5

1000H.: (30,5...33,5)

Dispersion cm3/ : 2,50

1000H.: (3,00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...0

3rd c-rod trav.mm : 7,8...8,2

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0,00...1,00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 1000

Contr.-rod trav.mm: 0,9...1,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 13...17

Setting point w/out aux. spring

Speed 1/min : 315

Contr.-rod trav.mm: 5,5

Testing:

Speed 1/min : 220  
C-rod trav.mm min : 8,0  
Speed 1/min : 315  
C-rod trav.mm : 5,4...5,6  
C-rod trav.mm : 1,5  
Speed 1/min : 630...730  
Speed 1/min : 1000  
C-rod trav.mm max : 1,0

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 380  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11,3...11,4  
2nd speed 1/min : 1800  
C-rod trav.mm : 10,9...11,1  
3rd speed 1/min : 2200  
C-rod trav.mm : 10,6...10,8

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34,0...35,5  
1000H.: (33,0...36,5)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33,5...35,5  
1000H.: (32,5...36,5)  
Dispersion cm3/ : 2,50  
1000H.: (3,00)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55,0  
1000H.: (55,0)  
Contr.-rod trav.mm: 20,1

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7,8...8,2  
Del.quantity cm3/ : 22,0...26,0  
1000H.: (21,0...27,0)  
Dispersion cm3/ : 2,5  
1000H.: (3,0)

#### LOW IDLE

Speed 1/min : 315  
Contr.-rod trav.mm: 5,4...5,6  
Del.quantity cm3/ : 5,0...6,0  
1000H.: (4,5...9,0)  
Dispersion cm3/ : 1,0  
1000H.: (1,5)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 340  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm3/ : (33,0...41,0)  
1000H.: -

Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: 0,0...1,0  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

#### Remarks:

##### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

#### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With  $n = 315$  1/min. and  $p_u = 450$  mbar, control rod must move quickly to control-rod travel = 0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 2,5 F8  
 Edition : 26.8.87  
 Superceeded : -  
 Calibrating oil : ISO 4113  
 Combination no. : 0 400 075 974  
 Injection pump  
 Pump designation : PESSM55C32ORS162  
 EP type number : 0 410 055 983  
 Governor  
 Governor design. : RSF340/2300M60-5  
 Governor no. : 0 420 021 063

Customer-spec. information  
 Customer : DB

Engine : OM602-LVP MJ:86

1st version kW : 66.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

START OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 1,70...1,80  
 : (1,65...1,85)  
 Contr.-rod trav.mm: 20,00...22,00  
 Cam sequence : 1- 2- 4- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-72-144-216-288  
 Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 11,3...11,4

Del.quantity cm3/ : 3,1...3,2

100H.: (3,0...3,3)

Dispersion cm3/ : 0,25

100H.: (0,30)

2nd speed 1/min: 315

Contr.-rod trav. m: 5,2...5,4

Del.quantity cm3/ : 0,5...0,6

100H.: (0,45...0,9)

Dispersion cm3/ : 0,10

100H.: (0,15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1000  
 Del.quantity cm3/ : 31,0...32,0  
 1000H.: (30,0...33,0)  
 Dispersion cm3/ : 2,50  
 1000H.: (3,00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 50...0  
 3rd c-rod trav.mm : 7,1...7,5  
 Speed 1/min : 0...2500  
 4th speed 1/min : 2950  
 C-rod trav.mm : 0,0...1,0

## SET IDLE CONTROL-LEVER

POSITION  
 Speed 1/min : 1000  
 Contr.-rod trav.mm: 1,9...2,0

## LOWEST RATED SPEED I

Control-lever  
 position degrees: 13...17  
 Setting point w/out aux. spring  
 Speed 1/min : 315  
 Contr.-rod trav.mm: 5,3

Testing:



Speed 1/min : 220  
C-rod trav.mm min : 7,5  
Speed 1/min : 315  
C-rod trav.mm : 5,2...5,4  
C-rod trav.mm : 2,5  
Speed 1/min : 530...630  
Speed 1/min : 1000  
C-rod trav.mm max : 2,0

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 380  
Contr.-rod trav.mm: 3,9...4,1  
: (3,8...4,2)

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000  
C-rod trav.mm : 11,3...11,4  
2nd speed 1/min : 1600  
C-rod trav.mm : 10,9...11,1  
3rd speed 1/min : 2250  
C-rod trav.mm : 10,3...10,5

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 1000  
Pressure hPa : 930  
Contr.-rod trav.mm: 0,1...0,5

##### Measurement

Speed 1/min : 1000

1st pressure hPa : 840  
C-rod trav.mm : 1,1...1,3  
2nd pressure hPa : 700  
C-rod trav.mm : 2,3...2,7

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1600  
Del.quantity cm3/ : 34,0...35,0  
1000H.: (33,0...36,5)  
Dispersion cm3/ : 2,5  
1000H.: (3,0)  
Speed 1/min : 2250  
Del.quantity cm3/ : 32,0...34,0  
1000H.: (31,0...35,0)  
Dispersion cm3/ : 2,5  
1000H.: (3,0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55,0  
1000H.: (55,0)  
Contr.-rod trav.mm: 20,1

#### HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7,1...7,5  
Del.quantity cm3/ : 16,0...20,0  
1000H.: (15,0...21,0)  
Dispersion cm3/ : 2,5  
1000H.: (3,0)

#### LOW IDLE

Speed 1/min : 315  
Contr.-rod trav.mm: 5,2...5,4  
Del.quantity cm3/ : 5,0...6,0  
1000H.: (4,5...9,0)  
Dispersion cm3/ : 1,0  
1000H.: (1,5)

#### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 340  
Contr.-rod trav.mm: (12,5...13,9)  
Del.quantity cm3/ : -  
1000H.: (33,0...41,0)

Electric current A: 1,8

Control lever at full-load stop

Speed 1/min : 2950  
Contr.-rod trav.mm: 0,0...1,0  
Electric current  
short-duration A : 3,0

Starting test

Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

#### Remarks:

##### CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

#### TESTING PNEUMATIC SHUTOFF DEVICE

-Control lever at idle stop.  
With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

#### START-OF-DELIVERY ADJUSTMENT

-Start-of delivery adjustment and lock after start-of-delivery mean value of all cylinders, 17.3...17.7°  
(17.2...17.8°) angular displacement of

the cam after cylinder 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W20  
 Edition : 03.04.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 076 973  
 Injection pump  
 Pump designation : PES6M55C320RS165  
 EP type number : 0 410 056 990  
 Governor  
 Governor design. : RSF315/2300M66-2  
 Governor no. : 0 420 021 099

Customer-spec. information  
 Customer : DB

Engine : OM603-3.0

1st version kW : 80.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.00 (1.00)

SD mark cyl. no. : 1

#### BASIC SETTING

1st speed 1/mi: 1000  
-----  
Contr.-rod trav.mm: 11.30...11.40  
-----  
Del.quantity cm3/ : 3.1...3.2  
-----  
100H.: (3.0...3.3)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.3)  
-----  
2nd speed 1/min: 290.0  
Contr.-rod trav. m: 5.4...5.6  
Del.quantity cm3/ : 0.5...0.6  
100H.: (0.5...0.9)  
Dispersion cm3/ : 0.1  
100H.: (0.15)

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del.quantity cm3/ : 31.5...32.5  
1000H.: (30.5...33.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...0  
3rd c-rod trav.mm : 7,80...8,20  
Speed 1/min : 0...2500  
4th speed 1/min : 2950  
C-rod trav.mm : 0.00...1.00

#### SET IDLE CONTROL-LEVER

POSITION  
Speed 1/min : 1000  
Contr.-rod trav.mm: 0,9...1,0

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 13...17  
Setting point w/out aux. spring  
Speed 1/min : 290  
Contr.-rod trav.mm: 5,5

Testing:

E17

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 5.40...5.60  
C-rod trav.mm : 1.50  
Speed 1/min : 620...720  
Speed 1/min : 1000  
C-rod trav.mm max : 1.00

#### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 4,20...4,40  
: (4,10...4,50)

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 11.30...11.40  
2nd speed 1/min : 1800  
C-rod trav.mm : 10.90...11.10  
3rd speed 1/min : 2200  
C-rod trav.mm : 10.60...10.80

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 1000  
Pressure hPa : 930  
Contr.-rod trav.mm: 0.10...0.50

#### Measurement

Speed 1/min : 1000  
1st pressure hPa : 840  
C-rod trav.mm : 1.10...1.30  
2nd pressure hPa : 700  
C-rod trav.mm : 2.30...2.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1800  
Del.quantity cm3/ : 34.0...35.5  
1000H.: (33.0...36.5)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Speed 1/min : 2200  
Del.quantity cm3/ : 33.5...35.5  
1000H.: (32.5...36.5)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 55.0...0.0  
1000H.: (55.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

## HIGH IDLE

Speed 1/min : 2500  
Contr.-rod trav.mm: 7.80...8.20  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

## LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

## SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop  
Speed 1/min : 315  
Contr.-rod trav.mm: (12,6...14,0)  
Del.quantity cm3/ : (32,0...40,0)  
1000H.: -  
Electric current A: 1,8  
Control lever at full-load stop  
Speed 1/min : 2950  
Contr.-rod trav.mm: 0,0...1,0  
Electric current  
short-duration A : 3,0  
Starting test  
Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 55,0

## Remarks:

### SETTING OF FBG

-Setting and locking of FBG according to start-of-delivery average of all cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference) between max/min value 1° cam angle maximum.

## CHECKING THE PNEUMATIC SHUTOFF BOX

-Control lever up against idle stop.  
At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

## CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 49°, max.  
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.  
Control-lever position 46.5°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

## ADJUSTING ACTIVE JOLT DAMPING (ARD)

Control lever at full-load stop. With n = 1000 1/min., I = 2.5 A, control-rod-travel reduction = 2.25...2.55 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 3,0 W19  
Edition : 21.08.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 076 977  
Injection pump  
Pump designation : PES6M55C32ORS165  
EP type number : 0 410 056 990  
Governor  
Governor design. : RSF315/2300M60-7  
Governer no. : 0 420 021 092

Customer-spec. information  
Customer : DB

Engine : OM603-3.0; MJ:88

1st version kW : 75.0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 20.00...22.00

Cam sequence : 1- 5- 3- 6- 2- 4

E19

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.00 (1.00)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 12.70...12.80

Del.quantity cm3/ : 3.0...3.1

100H.: (2.9...3.2)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 290.0

Contr.-rod trav. m: 6.9...7.1

Del.quantity cm3/ : 0.5...0.6

100H.: (0.5...0.9)

Dispersion cm3/ : 0.1

100H.: (0.15)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 800

Charge press. hPa : 1100

Del.quantity cm3/ : 30.5...31.5

1000H.: (29.5...32.5)

Dispersion cm3/ : 2.50

1000H.: (3.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 0...50

3rd c-rod trav.mm : 9,20...9,60

Speed 1/min : 0...2500

4th speed 1/min : 2950

C-rod trav.mm : 0.00...1.00

## SET IDLE CONTROL-LEVER

POSITION

Speed 1/min : 800

Contr.-rod trav.mm: 1,9...2,0

## LOWEST RATED SPEED I

Control-lever

position degrees: 12...16

Setting point w/out aux. spring

Speed 1/min : 290

Contr.-rod trav.mm: 7.0

### Testing:

Speed 1/min : 220  
C-rod trav.mm min : 7.00  
Speed 1/min : 290  
C-rod trav.mm : 6.90...7.10  
C-rod trav.mm : 2.50  
Speed 1/min : 630...730  
Speed 1/min : 800  
C-rod trav.mm max : 2.00

### SET IDLE AUXILIARY SPRING

Speed 1/min : 360  
Contr.-rod trav.mm: 5,60...5,80  
: (5,50...5,90)

### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 800  
C-rod trav.mm : 12.70...12.80  
2nd speed 1/min : 1600  
C-rod trav.mm : 12.00...12.20  
3rd speed 1/min : 2200  
C-rod trav.mm : 11.40...11.60

compensator (LDA,ADA,ALDA)

### 1st version

#### Setting

Speed 1/min : 800  
Pressure hPa : 950

#### Measurement

Speed 1/min : 800

1st pressure hPa : 900  
C-rod trav.mm : 0.50...0.70  
2nd pressure hPa : 750  
C-rod trav.mm : 1.80...2.20

### FUEL-DELIVERY CHARACTERISTICS

### 1st version

Charge press. hPa : 1100  
Speed 1/min : 1600  
Del.quantity cm3/ : 31.5...33.0  
1000H.: (30.5...34.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)  
Charge press. hPa : 1100  
Speed 1/min : 2200  
Del.quantity cm3/ : 32.0...34.0  
1000H.: (31.0...35.0)  
Dispersion cm3/ : 2.50  
1000H.: 3.00

### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 52.0...0.0  
1000H.: (52.0...0.0)  
Contr.-rod trav.mm: 20.10...0.00

### HIGH IDLE

### 1st version

Charge press. hPa : 1100  
Speed 1/min : 2500  
Contr.-rod trav.mm: 9.20...9.60  
Del.quantity cm3/ : 22.0...26.0  
1000H.: (21.0...27.0)  
Dispersion cm3/ : 2.50  
1000H.: (3.00)

### LOW IDLE

Speed 1/min : 290  
Contr.-rod trav.mm: 6.90...7.10  
Del.quantity cm3/ : 5.5...6.5  
1000H.: (5.0...9.5)  
Dispersion cm3/ : 1.00  
1000H.: (1.50)

### SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)

Control lever at idle stop

Speed 1/min : 315  
Contr.-rod trav.mm: (13,0...14,4)  
Del.quantity cm3/ : (30,0...38,0)  
1000H.: -

Electric current A: 1,8

Control lever at full-load stop

Speed 1/min : 2950  
Contr.-rod trav.mm: 0,0...1,0  
Electric current  
short-duration A : 3,0

Starting test

Speed 1/min : 100  
Del.quantity cm3/ : -  
min. 1000H.: 52,0

### Remarks:

#### SETTING OF FBG

-Setting and locking of FBG according  
to start-of-delivery average of all  
cylinders 19.3...19.7° (19.2...19.8°).  
Cam angle according to cyl. 1.

Start-of-delivery spacing (difference)  
between max/min value 1° cam angle  
maximum.

CHECKING THE PNEUMATIC SHUTOFF BOX

- Control lever up against idle stop.  
At  $n = 290$  1/min and  $p_u = 450$  mbar  
control rod must move briskly to  
control-rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY  
SPRING CUTOFF

- Control-lever position  $49^\circ$ , max.  
0.2 mm control-rod travel deduction  
allowable after switchover point (of  
starting cam) up to 1000 1/min.  
Control-lever position  $46.5^\circ$ ,  
control-rod travel deduction must be  
greater than 0.2 mm after switchover  
point (of starting cam).



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 1 G 27  
 Edition : 12.06.87  
 Superceeded : 30.3.87  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 463 153  
 Injection pump  
 Pump designation : PES3A80D410/3RS1350  
 EP type number : 0 410 483 023  
 Governor  
 Governor design. : RSV325...1250A2C2168  
 -3L  
 Governor no. : 0 420 232 475

Customer-spec. information  
 Customer : KHD

Engine : F3L912

1st version kW : 40.0  
 Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 3- 2

SD ang. spacing°CS: 0-120-240  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 10.10...10.20

Del.quantity cm3/ : 5.7...5.8

100H.: (5.6...6.0)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 6.8...7.0

Del.quantity cm3/ : 1.0...1.6

100H.: (0.8...1.7)

Dispersion cm3/ : 0.2

100H.: (0.3)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 3.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1250

Del.quantity cm3/ : 57.5...58.5

1000H.: (56.0...60.0)

Dispersion cm3/ : 2.50

1000H.: (3.50)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 41...49

Testing:

1st c-rod trav.mm : 9.10

Speed 1/min : 1290...1300

2nd c-rod trav.mm : 4.00

Speed 1/min : 1315...1345

3rd c-rod trav.mm : 4.00

Speed 1/min : 1330...1360  
4th speed 1/min : 1500  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 12...20  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 5.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 325  
C-rod trav.mm : 5.90...6.10  
C-rod trav.mm : 2.00  
Speed 1/min : 455...515

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1250  
C-rod trav.mm : 10.10...10.20  
2nd speed 1/min : 500  
C-rod trav.mm : 10.90...11.00  
4th speed 1/min : 1025  
C-rod trav.mm : 10.50...10.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del.quantity cm3/ : 54.0...56.0  
1000H.: (52.0...58.0)  
Dispersion cm3/ : 2.00  
1000H.: (-)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 9.10  
Speed 1/min : 1290...1300

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 130.0...140.0  
1000H.: (127.0...143.0)  
Contr.-rod trav.mm: 19.50...21.00

Remarks:  
: TKS2.50

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 1 G 25  
 Edition : 26.06.87  
 Superseded : 20.10.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 464 132  
 Injection pump  
 Pump designation : PES4A80D410/3RS1349  
 EP type number : 0 410 484 021  
 Governor  
 Governor design. : RSV325...1175A8C0657  
 -3L  
 Governor no. : 0 420 232 469

Customer-spec. information  
 Customer : KHD

Engine : F4L912

1st version kW : 51.0  
 Speed 1/min: 2350

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1175

Contr.-rod trav.mm: 10.10...10.20

Del.quantity cm3/ : 5.7...5.8

100H.: (5.6...6.0)

Dispersion cm3/ : 0.2

100H.: (0.4)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 6.7...6.9

Del.quantity cm3/ : 1.0...1.6

100H.: (0.8...1.7)

Dispersion cm3/ : 0.2

100H.: (0.3)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1175

Del.quantity cm3/ : 57.5...58.5

1000H.: (56.0...60.0)

Dispersion cm3/ : 2.50

1000H.: (4.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 52...60

Testing:

1st c-rod trav.mm : 9.10

Speed 1/min : 1215...1225

2nd c-rod trav.mm : 4.00

Speed 1/min : 1245...1275

3rd c-rod trav.mm : 4.00

Speed 1/min : 1250...1280

4th speed 1/min : 1420

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever

position degrees: 16...24

Setting point w/out aux. spring

Speed 1/min : 325

Contr.-rod trav.mm: 5.5

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 325

C-rod trav.mm : 5.90...6.10

C-rod trav.mm : 2.00

Speed 1/min : 450...510

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1175

C-rod trav.mm : 10.10...10.20

2nd speed 1/min : 500

C-rod trav.mm : 11.00...11.10

4th speed 1/min : 900

C-rod trav.mm : 10.50...10.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800

Del.quantity cm3/ : 54.5...56.5

1000H.: (52.5...58.5)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.10

Speed 1/min : 1215...1225

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 135.0...145.0

1000H.: (132.0...148.0)

Contr.-rod trav.mm: 19.50...21.00

Remarks:

: Dx3.70

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 1 G 28  
 Edition : 26.06.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 464 133  
 Injection pump  
 Pump designation : PES4A80D410/3RS1349  
 EP type number : 0 410 484 021  
 Governor  
 Governor design. : RSV325...1175A8C2163  
 -4L  
 Governor no. : 0 420 232 476

Customer-spec. information  
 Customer : KHD

Engine : F4L912

1st version kW : 51.0  
 Speed 1/min: 2350

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1175

Contr.-rod trav.mm: 10.10...10.20

Del.quantity cm3/ : 5.7...5.8

100H.: (5.6...6.0)

Dispersion cm3/ : 0.2

100H.: (0.4)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 6.7...6.9

Del.quantity cm3/ : 1.0...1.6

100H.: (0.8...1.7)

Dispersion cm3/ : 0.2

100H.: (0.3)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1175

Del.quantity cm3/ : 57.5...58.5

1000H.: (56.0...60.0)

Dispersion cm3/ : 2.50

1000H.: (4.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 52...60

Testing:

1st c-rod trav.mm : 9.10

Speed 1/min : 1215...1225

2nd c-rod trav.mm : 4.00

Speed 1/min : 1245...1275

3rd c-rod trav.mm : 4.00

Speed 1/min : 1250...1280

4th speed 1/min : 1420

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever

position degrees: 16...24

Setting point w/out aux. spring

Speed 1/min : 325

Contr.-rod trav.mm: 5.5

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 325

C-rod trav.mm : 5.90...6.10

C-rod trav.mm : 2.00

Speed 1/min : 450...510

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1175

C-rod trav.mm : 10.10...10.20

2nd speed 1/min : 500

C-rod trav.mm : 11.00...11.10

4th speed 1/min : 900

C-rod trav.mm : 10.50...10.70

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800

Del.quantity cm3/ : 55.0...57.0

1000H.: (53.0...59.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.10

Speed 1/min : 1215...1225

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 135.0...145.0

1000H.: (132.0...148.0)

Contr.-rod trav.mm: 19.50...21.00

Remarks:

: TKS2.70

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 19.0 K1  
Edition : 28.08.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 640 104  
Injection pump  
Pump designation : PE12A9SD610LS2453  
EP type number : 0 410 690 998  
Governor  
Governor design. : RQV300...1250AB1083L  
Governor no. : 0 420 212 111

Customer-spec. information  
Customer : KHD

Engine : F12L413F

1st version kW : 261.0  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 4- 9- 8- 5- 2-  
11- 10- 3- 6- 7- 12

SD ang. spacing°CS: 0-15-60-75-120-135-  
180-195-240-255-300-  
315

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 10.00...10.10

Del.quantity cm3/ : 8.7...8.9

100H.: (8.5...9.1)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 7.0...7.2

Del.quantity cm3/ : 1.7...2.2

100H.: (1.4...2.4)

Dispersion cm3/ : 0.3

100H.: (0.5)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1250

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1250

Del.quantity cm3/ : 87.0...89.0

1000H.: (85.0...91.0)

Dispersion cm3/ : 3.00

1000H.: (6.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 59...67

Testing:

1st c-rod trav.mm : 9.00

Speed 1/min : 1290...1300

2nd c-rod trav.mm : 4.00

Speed 1/min : 1350...1380

4th speed 1/min : 1500

C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I  
Control-lever  
position degrees: 7...15

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.50  
Speed 1/min : 300  
C-rod trav.mm : 5.90...6.10  
C-rod trav.mm : 2.00  
Speed 1/min : 585...615

CONSTANT REGULATION

Speed 1/min : 330...400

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1250  
C-rod trav.mm : 10.00...10.10  
2nd speed 1/min : 800  
C-rod trav.mm : 10.40...10.50  
3rd speed 1/min : 1025  
C-rod trav.mm : 10.20...10.40

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del.quantity cm3/ : 88.5...91.5  
1000H.: (86.0...94.0)  
Speed 1/min : 1000  
Del.quantity cm3/ : 85.5...88.5  
1000H.: (83.0...91.0)

SETTING CONTROL-ROD STOP

Speed 1/min : 600

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 9.00  
Speed 1/min : 1290...1300

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 14.30...15.30

LOW IDLE

Speed 1/min : 300

F01

Contr.-rod trav.mm: 7.00...7.20  
Del.quantity cm3/ : 17.0...22.0  
1000H.: (14.5...24.5)  
Dispersion cm3/ : 3.00  
1000H.: (5.00)

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 9,6 I 2  
Edition : 24.07.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 646 275  
  
Injection pump  
Pump designation : PE6A9SD410LS2621  
EP type number : 0 410 696 982  
Governor  
Governor design. : RQ300/1250AB1148-1L  
Governor no. : 0 420 200 104

Customer-spec. information  
Customer : KHD

Engine : F6L413F

1st version kW : 141.0  
Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 6- 5- 4- 3- 2

SD ang. spacing<sup>o</sup>CS: 0-75-120-195-240-315  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

#### BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 10.40...10.50

Del.quantity cm3/ : 9.2...9.4

100H.: (9.0...9.6)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.4...6.6

Del.quantity cm3/ : 0.8...1.4

100H.: (0.5...1.6)

Dispersion cm3/ : 0.3

100H.: (0.5)

#### SLEEVE POSITION

Control-lever position

Degree: -2

Speed 1/min: 600

Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1250

Del.quantity cm3/ : 92.0...94.0

1000H.: (90.0...96.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 20.0

Testing:

1st c-rod trav.mm : 9.40

Speed 1/min : 1295...1310

2nd c-rod trav.mm : 4.00

Speed 1/min : 1325...1355

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 6.5

Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.90

Speed 1/min : 300

C-rod trav.mm : 6.40...6.60

C-rod trav.mm : 2.00

Speed 1/min : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.17

Torque-control curve - 1st version

1st speed 1/min : 1250

C-rod trav.mm : 10.40...10.50

2nd speed 1/min : 600

C-rod trav.mm : 10.90...11.00

3rd speed 1/min : 915

C-rod trav.mm : 10.70...10.90

4th speed 1/min : 980

C-rod trav.mm : 10.40...10.60

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 650

Del.quantity cm3/ : 91.5...94.5

1000H.: (89.0...97.0)

#### SETTING CONTROL-ROD STOP

Speed 1/min : 650

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.40

Speed 1/min : 1295...1310

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 120.0...130.0

1000H.: (117.0...133.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : HAN 10.8 J  
 Edition : 28.08.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 676 188  
 Injection pump  
 Pump designation : PE6A95D32ORS2557  
 EP type number : 0 410 696 986  
 Governor  
 Governor design. : RSV350...1075A8C2226  
 R  
 Governor no. : 0 420 233 210

Customer-spec. information  
 Customer : HANOMAG

Engine : D964 E

1st version kW : 106.0  
 Speed 1/min: 2150

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 003

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1075

Contr.-rod trav.mm: 9.70...9.80

Del.quantity cm3/ : 7.9...8.1

100H.: (7.7...8.3)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.6...6.8

Del.quantity cm3/ : 0.9...1.5

100H.: (0.6...1.7)

Dispersion cm3/ : 0.3

100H.: (0.5)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 5.50

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1075

Del.quantity cm3/ : 79.5...81.5

1000H.: (77.5...83.5)

Dispersion cm3/ : 3.50

1000H.: (6.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...58

Testing:

1st c-rod trav.mm : 8.70

Speed 1/min : 1115...1125

2nd c-rod trav.mm : 4.00

Speed 1/min : 1145...1175

3rd c-rod trav.mm : 4.00

Speed 1/min : 1160...1190  
4th speed 1/min : 1325  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 20...28  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 5.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 5.90...6.10  
C-rod trav.mm : 2.00  
Speed 1/min : 490...550

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1075  
C-rod trav.mm : 9.70...9.80  
2nd speed 1/min : 500  
C-rod trav.mm : 10.80...10.90  
4th speed 1/min : 855  
C-rod trav.mm : 10.20...10.40

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 79.0...82.0  
1000H.: (76.5...84.5)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 8.70  
Speed 1/min : 1115...1125

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 19.50...21.00

Remarks:  
APPLICATION  
Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 4.0 A  
Edition : 24.07.87  
Superceeded : 9.3.87  
Calibrating oil : ISO-4113

Combination no. : 0 400 844 083

Injection pump  
Pump designation : PES4A90D410RS2666  
EP type number : 0 410 894 029  
Governor  
Governor design. : RQV300...1400AB1065-SL  
Governor no. : 0 420 212 169

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM364

1st version kW : 66.0  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400

---

Contr.-rod trav.mm: 10.90...11.00

---

Del.quantity cm3/ : 6.3...6.4

---

100H.: (6.1...6.6)

---

Dispersion cm3/ : 0.3

---

100H.: (0.5)

---

2nd speed 1/min: 300.0  
Contr.-rod trav. m: 8.6...8.8  
Del.quantity cm3/ : 0.8...1.2  
100H.: (0.6...1.4)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300  
Sleeve travel mm: 0.80...1.30  
2nd speed 1/min: 500  
Sleeve travel mm: 2.30...2.80  
3rd speed 1/min: 750  
Sleeve travel mm: 4.10...4.30  
4th speed 1/min: 1500  
Sleeve travel mm: 8.50...8.60

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1500  
Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1400  
Del.quantity cm3/ : 63.0...64.0  
1000H.: (61.0...66.0)  
Dispersion cm3/ : 3.00  
1000H.: (5.00)

## HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 58...66

Testing:

1st c-rod trav.mm : 9.90  
Speed 1/min : 1450...1460  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1560...1590  
4th speed 1/min : 1630  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: 20...28

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 10.20  
Speed 1/min : 300  
C-rod trav.mm : 8.60...8.80  
C-rod trav.mm : 2.00

CONSTANT REGULATION

Speed 1/min : 540...680

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1400  
C-rod trav.mm : 10.90...11.00  
2nd speed 1/min : 630  
C-rod trav.mm : 12.20...12.30  
3rd speed 1/min : 900  
C-rod trav.mm : 11.50...11.70

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 630  
Del.quantity cm3/ : 55.5...58.5  
1000H.: (53.0...61.0)  
Speed 1/min : 900  
Del.quantity cm3/ : 54.5...57.5  
1000H.: (52.0...60.0)

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.90  
Speed 1/min : 1450...1460

MIDDLE RATED SPEED

Contr.-rod trav.mm: 4.00

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 17.00...17.40

Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : LIE S,6 B  
Edition : 28.08.87  
Superceeded : 13.5.87  
Calibrating oil : ISO-4113

Combination no. : 0 400 844 085

Injection pump  
Pump designation : PES4A100D41ORS2686  
EP type number : 0 410 804 001  
Governor  
Governor design. : RQV400...1000AB1203L  
Governor no. : 0 420 212 177

Customer-spec. information  
Customer : LIEBHERR

Engine : D904T

1st version kW : 100.0  
Speed 1/min: 2000

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)  
Contr.-rod trav.mm: 9.00...12.00

F09

Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - ° : 0.50 (0.75)

**START OF DELIVERY DIFFERENCE**

betw.c-rod trav.mm: 9.00...12.00  
Difference ° CS : 4.00...5.00

**BASIC SETTING**

1st speed 1/mi: 1000

Contr.-rod trav.mm: 12.50...12.60

Del.quantity cm3/ : 12.1...12.3  
100H.: (11.9...12.5)

Dispersion cm3/ : 0.3  
100H.: (0.6)

2nd speed 1/min: 400.0  
Contr.-rod trav. m: 7.4...7.6  
Del.quantity cm3/ : 1.5...2.1  
100H.: (1.2...2.3)

Dispersion cm3/ : 0.3  
100H.: (0.5)

(B) Setting of injection pump with  
externally-mounted governor

**SLEEVE TRAVELS**

1st speed 1/min: 435  
Sleeve travel mm: 2.10...2.30  
2nd speed 1/min: 500  
Sleeve travel mm: 3.00...3.40  
3rd speed 1/min: 1040  
Sleeve travel mm: 8.10...8.20  
4th speed 1/min: 1135  
Sleeve travel mm: 9.20...9.70

**SLEEVE POSITION**

Control-lever position  
Degree: 1  
Speed 1/min: 1000  
Contr.-rod travelmm: 15.20...17.80

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version  
Speed 1/min: 1000  
Charge press. hPa : 800  
Del.quantity cm3/ : 121.5...123.5  
1000H.: (119.5...125.5)

Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (6.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 58...66

Testing:

1st c-rod trav.mm : 11.50

Speed 1/min : 1040...1050

2nd c-rod trav.mm : 4.00

Speed 1/min : 1125...1155

4th speed 1/min : 1250

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 9...17

Testing:

Speed 1/min : 100

C-rod trav.mm min : 9.00

Speed 1/min : 400

C-rod trav.mm : 7.40...7.60

#### CONSTANT REGULATION

Speed 1/min : 425...530

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1000

C-rod trav.mm : 12.50...12.60

2nd speed 1/min : 500

C-rod trav.mm : 13.80...13.90

4th speed 1/min : 860

C-rod trav.mm : 13.30...13.50

5th speed 1/min : 920

C-rod trav.mm : 12.90...13.10

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 800

Contr.-rod trav.mm: 13.80...13.90

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 12.70...12.80

2nd pressure hPa : 655

C-rod trav.mm : 13.60...13.70

3rd pressure hPa : 610

C-rod trav.mm : 13.00...13.20

#### SWITCH-OVER POINT

F10

Speed 1/min : 320 (340)

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 800

Speed 1/min : 650

Del.quantity cm<sup>3</sup>/ : 133.5...136.5  
1000H.: (131.0...139.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm<sup>3</sup>/ : 104.0...107.0  
1000H.: (102.0...109.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.50

Speed 1/min : 1040...1050

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm<sup>3</sup>/ : 113.0...123.0  
1000H.: (110.0...126.0)

Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 400

Contr.-rod trav.mm: 7.40...7.60

Del.quantity cm<sup>3</sup>/ : 15.0...21.0  
1000H.: (12.5...23.5)

Dispersion cm<sup>3</sup>/ : 3.50  
1000H.: (5.50)

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 I 5  
Edition : 26.06.87  
Superceeded : 10.84  
Calibrating oil : ISO-4113

Combination no. : 0 400 846 242

Injection pump  
Pump designation : PES6A80D410RS2085Y  
EP type number : 0 410 886 044  
Governor  
Governor design. : RQV300...1475AB622DL  
Governor no. : 0 420 214 097

Customer-spec. information  
Customer : DAIMLER-BENZ  
Speed 1/min: 2950

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1450

Contr.-rod trav.mm: 8.20...8.30

Del.quantity cm3/ : 4.6...4.7

100H.: (4.4...4.8)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.5...6.7

Del.quantity cm3/ : 1.2...1.6

100H.: (1.0...1.7)

Dispersion cm3/ : 0.2

100H.: (0.3)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 1460

Sleeve travel mm: 8.40...8.60

2nd speed 1/min: 950

Sleeve travel mm: 5.20...5.50

3rd speed 1/min: 775

Sleeve travel mm: 4.10...4.60

4th speed 1/min: 550

Sleeve travel mm: 2.70...3.00

5th speed 1/min: 300

Sleeve travel mm: 0.70...1.20

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1420

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1450

Del.quantity cm3/ : 46.0...47.0

1000H.: (44.5...48.5)

Dispersion cm3/ : 2.00

1000H.: (3.50)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 56...64

Testing:

1st c-rod trav.mm : 7.20

Speed 1/min : 1505...1515

2nd c-rod trav.mm : 4.00

Speed 1/min : 1560...1590

4th speed 1/min : 1700

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 10...18

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.10

Speed 1/min : 300

C-rod trav.mm : 6.50...6.70

#### CONSTANT REGULATION

Speed 1/min : 380...500

#### TORQUE CONTROL

Dimension a mm : 1.00

Torque-control curve - 1st version

1st speed 1/min : 1450

C-rod trav.mm : 8.20...8.30

2nd speed 1/min : 500

C-rod trav.mm : 9.20...9.30

3rd speed 1/min : 800

C-rod trav.mm : 8.90...9.10

4th speed 1/min : 1000

C-rod trav.mm : 8.60...8.90

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 41.0...44.0

1000H.: (39.0...46.0)

Speed 1/min : 800

Del.quantity cm3/ : 45.5...47.5

1000H.: (44.0...49.0)

Speed 1/min : 1000

Del.quantity cm3/ : 46.0...48.0

1000H.: (44.0...50.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 7.20

Speed 1/min : 1505...1515

#### MIDDLE RATED SPEED

Contr.-rod trav.mm: 7.20

Speed 1/min : 1320...1330

Contr.-rod trav.mm: 4.00

Speed 1/min : 1360...1390

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 13.70...14.10

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 7,0 C 1  
Edition : 28.08.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 846 264  
Injection pump  
Pump designation : PES6A85D32ORS2337  
EP type number : 0 410 886 921  
Governor  
Governor design. : RQ200/1250AB801DR  
Governor no. : 0 420 203 089

Customer-spec. information  
Customer : MAN

Engine : D0846HM42U

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 000  
Inlet press., bar : 1.00  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
Opening  
pressure, bar : 172...175  
Test inj. tubing : 1 680 750 014  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 1.50...1.60  
: (1.45...1.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - <sup>0</sup> : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 1250

Contr.-rod trav.mm: 10.70...10.80

Del.quantity cm3/ : 7.0...7.1

100H.: (6.8...7.3)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 200.0

Contr.-rod trav. m: 8.4...8.6

Del.quantity cm3/ : 1.8...2.4

100H.: (1.6...2.6)

Dispersion cm3/ : -

100H.: (0.4)

#### SLEEVE POSITION

Control-lever position

Degree: -2

Speed 1/min: 550

Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1250

Del.quantity cm3/ : 70.0...71.0

1000H.: (68.0...73.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 550

Contr.-rod trav.mm: 20.0

Testing:

1st c-rod trav.mm : 9.75

Speed 1/min : 1295...1310

2nd c-rod trav.mm : 4.00

Speed 1/min : 1335...1365

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 200

Contr.-rod trav.mm: 8.5

Testing:

F15

Speed 1/min : 100

C-rod trav.mm min : 9.90

Speed 1/min : 200

C-rod trav.mm : 8.40...8.60

C-rod trav.mm : 2.00

Speed 1/min : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.30

Torque-control curve - 1st version

1st speed 1/min : 1250

C-rod trav.mm : 10.70...10.80

2nd speed 1/min : 500

C-rod trav.mm : 11.40...11.50

4th speed 1/min : 1000

C-rod trav.mm : 11.10...11.30

5th speed 1/min : 1125

C-rod trav.mm : 10.80...11.00

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 0.0...69.5

1000H.: (0.0...72.0)

Speed 1/min : 800

Del.quantity cm3/ : 69.0...72.0

1000H.: (66.5...74.5)

#### SETTING CONTROL-ROD STOP

Speed 1/min : 200

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.75

Speed 1/min : 1295...1310

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 123.0...133.0

1000H.: (120.0...136.0)

Contr.-rod trav.mm: 18.10...18.50

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6.0 A  
Edition : 24.07.87  
Superceeded : 9.3.87  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 846 522  
  
Injection pump  
Pump designation : PES6A90D41ORS2667  
EP type number : 0 410 896 080  
Governor  
Governor design. : RQV300...1400AB1065-4L  
Governor no. : 0 420 212 168

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 100.0  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 11.10...11.20

Del.quantity cm3/ : 6.3...6.4

100H.: (6.1...6.6)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 8.9...9.1

Del.quantity cm3/ : 0.9...1.3

100H.: (0.7...1.5)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.80...1.30

2nd speed 1/min: 500

Sleeve travel mm: 2.30...2.80

3rd speed 1/min: 750

Sleeve travel mm: 4.10...4.30

4th speed 1/min: 1500

Sleeve travel mm: 8.50...8.60

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1500

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Del.quantity cm3/ : 63.5...64.5

1000H.: (61.5...66.5)

Dispersion cm3/ : 3.00

1000H.: (4.50)

## HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 61...69

Testing:

1st c-rod trav.mm : 10.10  
Speed 1/min : 1460...1470  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1560...1590  
4th speed 1/min : 1630  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: 21...29

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 10.30  
Speed 1/min : 300  
C-rod trav.mm : 8.90...9.10

CONSTANT REGULATION

Speed 1/min : 540...680

TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1400  
C-rod trav.mm : 11.10...12.20  
2nd speed 1/min : 500  
C-rod trav.mm : 12.30...12.40  
3rd speed 1/min : 900  
C-rod trav.mm : 11.90...12.10  
4th speed 1/min : 1100  
C-rod trav.mm : 11.40...11.70

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 52.0...54.0  
1000H.: (49.5...56.5)  
Speed 1/min : 900  
Del.quantity cm3/ : 55.0...58.0  
1000H.: (52.5...60.5)

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.10  
Speed 1/min : 1460...1470

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 17.00...17.40  
Set shutoff stop to contact at  
3.0...3.5 mm control-rod travel.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VAU 5,4 A 1  
 Edition : 24.07.87  
 Superceeded : 1.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 846 533  
 Injection pump  
 Pump designation : PES6A9SD32ORS2646  
 EP type number : 0 410 896 923  
 Governor  
 Governor design. : RQV300...1300AB1163-1R  
 Governor no. : 0 420 213 104

Customer-spec. information  
 Customer : VAUXHALL

Engine : 330T/C

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 10.00...11.00  
 Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed 1/mi: 810  
 -----  
 Contr.-rod trav.mm: 9.70...9.80  
 -----  
 Del.quantity cm3/ : 6.3...6.5  
 -----  
 100H.: (6.1...6.7)  
 -----  
 Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.6)  
 -----  
 2nd speed 1/min: 300.0  
 Contr.-rod trav. m: 5.9...6.1  
 Del.quantity cm3/ : 0.8...1.4  
 100H.: (0.5...1.6)  
 Dispersion cm3/ : 0.3  
 100H.: (0.5)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 275  
 Sleeve travel mm: 0.90...1.10  
 2nd speed 1/min: 500  
 Sleeve travel mm: 3.10...3.50  
 3rd speed 1/min: 1000  
 Sleeve travel mm: 5.70...5.80  
 4th speed 1/min: 1300  
 Sleeve travel mm: 7.90...8.10

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 1400  
 Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 810  
 Del.quantity cm3/ : 63.5...65.5  
 1000H.: (61.5...67.5)  
 Dispersion cm3/ : 3.50  
 1000H.: (6.00)

## HIGHEST RATED SPEED



1st version  
Control-lever  
position degrees: 57...65

Testing:  
1st c-rod trav.mm : 8.70  
Speed 1/min : 1350...1360  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1455...1485  
4th speed 1/min : 1600  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I  
Control-lever  
position degrees: 13...21

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 7.40  
Speed 1/min : 300  
C-rod trav.mm : 5.90...6.10

CONSTANT REGULATION  
Speed 1/min : 350...490

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS  
Speed 1/min : 1200  
Del.quantity cm3/ : 71.5...74.5  
1000H.: (69.5...76.5)  
Speed 1/min : 500  
Del.quantity cm3/ : 52.0...55.0  
1000H.: (50.0...57.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 8.70  
Speed 1/min : 1350...1360

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 97.0...107.0  
1000H.: (94.0...110.0)  
Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 5.90...6.10

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 A  
 Edition : 10.08.87  
 Superceeded : 12.9.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 846 547  
 Injection pump  
 Pump designation : PES6A90D410RS2713  
 EP type number : 0 410 896 083  
 Governor  
 Governor design. : RQV300...1350AB1175-1L  
 Governor no. : 0 420 212 183

Customer-spec. information  
 Customer : FIAT

Engine : 8060.25.661

1st version kW : 88.0  
 Speed 1/min: 2700

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1350

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm3/ : 6.8...6.9

100H.: (6.6...7.1)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 9.7...9.9

Del.quantity cm3/ : 1.2...1.8

100H.: (1.0...2.0)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 0.90...1.10

2nd speed 1/min: 435

Sleeve travel mm: 2.40...2.60

3rd speed 1/min: 780

Sleeve travel mm: 4.20...4.40

4th speed 1/min: 1400

Sleeve travel mm: 8.10...8.20

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1430

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1350

Charge press. hPa : 700

Del.quantity cm3/ : 68.0...69.0

1000H.: (66.0...71.0)

Dispersion cm3/ : 3.00

1000H.: (5.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 55...63

Testing:

1st c-rod trav.mm : 10.70

Speed 1/min : 1390...1400

2nd c-rod trav.mm : 4.00

Speed 1/min : 1515...1545

4th speed 1/min : 1650

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 14...21

Testing:

Speed 1/min : 100

C-rod trav.mm min : 11.20

Speed 1/min : 300

C-rod trav.mm : 9.70...9.90

## CONSTANT REGULATION

Speed 1/min : 350...450

## TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1350

C-rod trav.mm : 11.70...11.80

2nd speed 1/min : 500

C-rod trav.mm : 11.70...11.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 11.70...11.80

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.40...11.50

2nd pressure hPa : 260

C-rod trav.mm : 11.60...11.70

## FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700

Speed 1/min : 800

Del.quantity cm3/ : 57.5...59.5

1000H.: (55.0...62.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 46.5...48.5

1000H.: (44.5...50.5)

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.70

Speed 1/min : 1390...1400

## STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 100.0...110.0

1000H.: (97.0...113.0)

Contr.-rod trav.mm: 17.10...17.50

Remarks:

Test electrically-released starting quantity (EES) with 12 volts

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : FIA 5,9 B 1  
 Edition : 12.06.87  
 Superceeded : 12.9.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 846 552  
 Injection pump  
 Pump designation : PES6A90D410RS2723  
 EP type number : 0 410 896 085  
 Governor  
 Governor design. : RQV300...1500AB1152-  
 2L  
 Governor no. : 0 420 212 196

Customer-spec. information  
 Customer : IVECO-FIAT

Engine : 8060.05.662

1st version kW : 88.0  
 Speed 1/min: 3000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle\*holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.20...2.30  
 : (2.15...2.35)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1500

Contr.-rod trav.mm: 10.00...10.10

Del.quantity cm3/ : 5.7...5.8

100H.: (5.5...6.0)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 8.8...9.0

Del.quantity cm3/ : 1.0...1.6

100H.: (0.8...1.8)

Dispersion cm3/ : 0.2

100H.: (0.4)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 345

Sleeve travel mm: 2.20...2.40

2nd speed 1/min: 410

Sleeve travel mm: 2.80...3.20

3rd speed 1/min: 630

Sleeve travel mm: 4.30...4.70

4th speed 1/min: 1545

Sleeve travel mm: 8.60...8.70

5th speed 1/min: 1650

Sleeve travel mm: 9.30...9.50

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1525

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1500

Del.quantity cm3/ : 57.5...58.5

1000H.: (55.5...60.5)

Dispersion cm3/ : 3.00

1000H.: (4.50)

quantity (EES) with 12 volts

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 56...64

#### Testing:

1st c-rod trav.mm : 9.00

Speed 1/min : 1540...1550

2nd c-rod trav.mm : 4.00

Speed 1/min : 1655...1685

#### LOWEST RATED SPEED I

Control-lever

position degrees: 14...22

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 10.30

Speed 1/min : 300

C-rod trav.mm : 8.80...9.00

#### CONSTANT REGULATION

Speed 1/min : 330...430

#### TORQUE CONTROL

Dimension a mm : 0.90

Torque-control curve - 1st version

1st speed 1/min : 1500

C-rod trav.mm : 10.00...10.10

2nd speed 1/min : 500

C-rod trav.mm : 10.90...11.00

3rd speed 1/min : 725

C-rod trav.mm : 10.60...10.80

4th speed 1/min : 1175

C-rod trav.mm : 10.00...10.20

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm<sup>3</sup>/ : 48.0...50.0

1000H.: (45.5...52.5)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.00

Speed 1/min : 1540...1550

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm<sup>3</sup>/ : 95.0...105.0

1000H.: (92.0...108.0)

Contr.-rod trav.mm: 16.00...16.40

#### Remarks:

Test electrically-released starting

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 1 G 30  
 Edition : 31.07.87  
 Superceeded : 9.3.87  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 863 012  
 Injection pump  
 Pump designation : PES3A85D410/3RS2731  
 EP type number : 0 410 883 988  
 Governor  
 Governor design. : RSV325...1250A2C2168  
 -3L  
 Governor no. : 0 420 232 475  
 Customer-spec. information  
 Customer : KHD

Engine : F3L913  
 1st version kW : 44.0  
 Speed 1/min: 2500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000  
 Inlet press., bar : 1.00  
 Calibrating nozzle-holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test inj. tubing : 1 680 750 014  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27  
 Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 2

SD ang. spacing<sup>o</sup>CS: 0-120-240  
Tolerance + - <sup>o</sup> : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1250  
-----  
Contr.-rod trav.mm: 9.90...10.00  
-----  
Del.quantity cm3/ : 6.8...6.9  
-----  
100H.: (6.6...7.1)  
-----  
Dispersion cm3/ : 0.3  
-----  
100H.: (0.5)  
-----  
2nd speed 1/min: 325.0  
Contr.-rod trav. m: 6.2...6.4  
Del.quantity cm3/ : 1.0...1.6  
100H.: (0.8...1.8)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Contr.-rod travelmm: 0.30...0.70

Governor-spring reload  
Notch setting x : 4.50

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1250  
Del.quantity cm3/ : 68.5...69.5  
1000H.: (66.5...71.5)  
Dispersion cm3/ : 3.00  
1000H.: (5.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 41...49

Testing:  
1st c-rod trav.mm : 8.90  
Speed 1/min : 1290...1300  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1315...1345  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1330...1360  
4th speed 1/min : 1500

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 12...20  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 5.8

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 325  
C-rod trav.mm : 6.20...6.40  
C-rod trav.mm : 2.00  
Speed 1/min : 460...520

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1250  
C-rod trav.mm : 9.90...10.00  
2nd speed 1/min : 500  
C-rod trav.mm : 10.20...10.30  
4th speed 1/min : 960  
C-rod trav.mm : 9.90...10.10

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del.quantity cm3/ : 58.0...60.0  
1000H.: (55.5...62.5)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 8.90  
Speed 1/min : 1290...1300

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 115.0...125.0  
1000H.: (112.0...128.0)  
Contr.-rod trav.mm: 17.00...17.20

Remarks:

: TKS2.60

#### APPLICATION

Tractor (tractor engines)

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 4,1 D  
 Edition : 10.08.87  
 Superseded : 13.5.87  
 Calibrating oil : ISO-4113

Combination no. : 0 400 864 063

Injection pump  
 Pump designation : PES4A85D410/3RS2638  
 EP type number : 0 410 884 950  
 Governor  
 Governor design. : RSV325...1400A8C707-3L  
 Governor no. : 0 420 232 440

Customer-spec. information  
 Customer : KHD

Engine : BF4L913

1st version kW : 78.0  
 Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.50...2.60  
 : (2.45...2.65)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1250

---

Contr.-rod trav.mm: 12.70...12.80

---

Del.quantity cm3/ : 8.2...8.3

---

100H.: (8.0...8.5)

---

Dispersion cm3/ : 0.3

---

100H.: (0.4)

---

2nd speed 1/min: 325.0  
 Contr.-rod trav. m: 8.4...8.6  
 Del.quantity cm3/ : 0.8...1.4  
 100H.: (0.6...1.6)  
 Dispersion cm3/ : 0.2  
 100H.: (0.4)

## SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed 1/min: 800  
 Contr.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1250  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 82.5...83.5  
 1000H.: (80.5...85.5)  
 Dispersion cm3/ : 3.00  
 1000H.: (4.50)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 49...57

Testing:  
 1st c-rod trav.mm : 11.70  
 Speed 1/min : 1290...1300  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1315...1345  
 3rd c-rod trav.mm : 4.00  
 Speed 1/min : 1360...1390



4th speed 1/min : 1540  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 9...17  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 8.0  
Speed 1/min : 325  
C-rod trav.mm : 8.40...8.60  
C-rod trav.mm : 2.00  
Speed 1/min : 620...680

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1250  
C-rod trav.mm : 12.70...12.80  
2nd speed 1/min : 500  
C-rod trav.mm : 13.70...13.80  
3rd speed 1/min : 850  
C-rod trav.mm : 13.50...13.60  
4th speed 1/min : 950  
C-rod trav.mm : 13.20...13.40

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 13.70...13.80

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 12.50...12.60  
2nd pressure hPa : 390  
C-rod trav.mm : 13.50...13.60  
3rd pressure hPa : 250  
C-rod trav.mm : 12.80...13.00

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 700  
Speed 1/min : 850  
Del.quantity cm3/ : 84.5...86.5  
1000H.: (82.0...89.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 59.5...61.5  
1000H.: (57.5...63.5)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 11.70

Speed 1/min : 1290...1300

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 95.0...105.0  
1000H.: (92.0...108.0)  
Contr.-rod trav.mm: 17.10...17.30

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 4,1 G  
Edition : 12.06.87  
Superceeded : 23.9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 400 864 066  
Injection pump  
Pump designation : PES4AB0D410/3RS2717  
EP type number : 0 410 884 045  
Governor  
Governor design. : RSV325...900A1C602-2  
L  
Governor no. : 0 420 232 448

Customer-spec. information  
Customer : KHD

Engine : F4L913

1st version kW : 43.0  
Speed 1/min: 1800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.10...2.20  
: (2.05...2.25)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 880  
-----  
Contr.-rod trav.mm: 10.20...10.30  
-----  
Del.quantity cm3/ : 4.9...5.0  
-----  
100H.: (4.8...5.2)  
-----  
Dispersion cm3/ : 0.2  
-----  
100H.: (0.4)  
-----  
2nd speed 1/min: 325.0  
Contr.-rod trav. m: 7.8...8.0  
Del.quantity cm3/ : 1.0...1.6  
100H.: (0.8...1.7)  
Dispersion cm3/ : 0.2  
100H.: (0.3)

## SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
Notch setting x : 4.25

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 880  
Del.quantity cm3/ : 49.5...50.5  
1000H.: (48.0...52.0)  
Dispersion cm3/ : 2.50  
1000H.: (4.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 44...52

Testing:  
1st c-rod trav.mm : 9.20  
Speed 1/min : 920...930  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 945...975  
4th speed 1/min : 1110  
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever

position degrees: 21...29

Setting point w/out aux. spring

Speed 1/min : 325

Contr.-rod trav.mm: 7.9

Speed 1/min : 325

C-rod trav.mm : 7.80...8.00

C-rod trav.mm : 2.00

Speed 1/min : 350...410

SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.20

Speed 1/min : 920...930

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 125.0...135.0

1000H.: (122.0...138.0)

Contr.-rod trav.mm: 19.50...21.00

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM 4,1 C  
Edition : 31.07.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 400 864 071  
Injection pump  
Pump designation : PES4A90D320/3RS2743  
EP type number : 0 410 894 034  
Governor  
Governor design. : RSV325...1500A2CS05-  
2R  
Governor no. : 0 420 233 196

Customer-spec. information  
Customer : MWM

Engine : TD226B-4

1st version kW : 65.0  
Speed 1/min: 3000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.95...3.05  
(2.90...3.10)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
Tolerance + - ° : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 9.00...0.00  
Difference ° CS : 3.50...4.50

## BASIC SETTING

1st speed 1/mi: 1075

Contr.-rod trav.mm: 9.80...9.90

Del.quantity cm3/ : 7.4...7.5

100H.: (7.2...7.7)

Dispersion cm3/ : 0.3

100H.: (0.5)

2nd speed 1/min: 325.0

Contr.-rod trav. m: 6.7...6.9

Del.quantity cm3/ : 0.9...1.5

100H.: (0.7...1.7)

Dispersion cm3/ : 0.2

100H.: (0.4)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 3.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1075

Del.quantity cm3/ : 74.5...75.5

1000H.: (72.5...77.5)

Dispersion cm3/ : 3.00

1000H.: (5.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 42...50

Testing:

1st c-rod trav.mm : 8.80

Speed 1/min : 1115...1125

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1155...1185  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1170...1200  
4th speed 1/min : 1330  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 18...26  
Setting point w/out aux. spring  
Speed 1/min : 325  
Contr.-rod trav.mm: 6.3

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 325  
C-rod trav.mm : 6.70...6.90  
C-rod trav.mm : 2.00  
Speed 1/min : 420...480

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1075  
C-rod trav.mm : 9.80...9.90  
2nd speed 1/min : 500  
C-rod trav.mm : 9.80...10.00

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 8.80  
Speed 1/min : 1115...1125

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 132.0...142.0  
1000H.: (129.0...145.0)  
Contr.-rod trav.mm: 19.50...21.00

Remarks:  
APPLICATION  
Excavator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : LIE 5,6 A  
 Edition : 28.08.87  
 Superceeded : 12.9.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 874 238  
 Injection pump  
 Pump designation : PES4A95D41ORS2685  
 EP type number : 0 410 894 996  
 Governor  
 Governor design. : RSV400...1000A1C2187  
 Governor no. : 0 420 232 387

Customer-spec. information  
 Customer : LIEBHERR

Engine : D904 NA

1st version kW : 70.0  
 Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
 : (2.65...2.85)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 3- 4- 2

SD ang. spacing°CS: 0-90-180-270  
 Tolerance + - ° : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 8.50...9.50  
 Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 10.20...10.30

Del.quantity cm3/ : 8.6...8.8

100H.: (8.4...9.0)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 400.0

Contr.-rod trav. m: 6.1...6.3

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.8)

Dispersion cm3/ : 0.3

100H.: (0.5)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 3.50

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 86.0...88.0

1000H.: (84.0...90.0)

Dispersion cm3/ : 3.50

1000H.: (6.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 45...53

Testing:

1st c-rod trav.mm : 9.20

Speed 1/min : 1040...1050

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1050...1080  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1085...1115  
4th speed 1/min : 1230  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 17...26  
Setting point w/out aux. spring  
Speed 1/min : 400  
Contr.-rod trav.mm: 5.7

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 400  
C-rod trav.mm : 6.10...6.30  
C-rod trav.mm : 2.00  
Speed 1/min : 515...575

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 10.20...10.30  
2nd speed 1/min : 500  
C-rod trav.mm : 10.20...10.40

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 80.5...83.5  
1000H.: (78.0...86.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 9.20  
Speed 1/min : 1040...1050

#### MIDDLE RATED SPEED

Contr.-rod trav.mm: 4.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 400  
Contr.-rod trav.mm: 6.10...6.30  
Del.quantity cm3/ : 10.0...16.0  
1000H.: (7.5...18.5)

Dispersion cm3/ : 3.50  
1000H.: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 4,0 B  
Edition : 21.08.87  
Superceeded : 22.10.86  
Calibrating oil : ISO-4113

Combination no. : 0 400 874 240

Injection pump  
Pump designation : PES4A90D41ORS2666  
EP type number : 0 410 894 029  
Governor  
Governor design. : RSV350...1400AOC2006  
-1L  
Governor no. : 0 420 232 449

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM364

1st version kW : 66.0  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)



Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing<sup>o</sup>CS: 0-90-180-270  
Tolerance + - <sup>o</sup> : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1380  
-----  
Contr.-rod trav.mm: 10.40...10.50  
-----  
Del.quantity cm3/ : 6.3...6.4  
-----  
100H.: (6.1...6.6)  
-----  
Dispersion cm3/ : 0.3  
-----  
100H.: (0.4)  
-----  
2nd speed 1/min: 350.0  
Contr.-rod trav. m: 7.8...8.0  
Del.quantity cm3/ : 0.6...1.0  
100H.: (0.4...1.2)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Contr.-rod travelmm: 0.30...0.10

Governor-spring reload  
Notch setting x : 4.50

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1380  
Del.quantity cm3/ : 63.0...64.0  
1000H.: (61.0...66.0)  
Dispersion cm3/ : 3.00  
1000H.: (4.50)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 59...67

Testing:  
1st c-rod trav.mm : 9.40  
Speed 1/min : 1430...1440  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1480...1510  
4th speed 1/min : 1575  
C-rod trav.mm : 0.30...1.70

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 24...32  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 7.9

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 7.80...8.00  
C-rod trav.mm : 2.00  
Speed 1/min : 480...540

#### SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1380  
C-rod trav.mm : 10.40...10.50  
2nd speed 1/min : 500  
C-rod trav.mm : 11.70...11.80  
3rd speed 1/min : 900  
C-rod trav.mm : 11.10...11.30

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 52.0...54.0  
1000H.: (49.5...56.5)  
Dispersion cm3/ : -  
1000H.: (5.50)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 9.40  
Speed 1/min : 1430...1440

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 16.30...16.70

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 7.80...8.00  
Del.quantity cm3/ : 6.0...10.0  
1000H.: (4.0...12.0)  
Dispersion cm3/ : 2.50  
1000H.: (4.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 4,0 C  
Edition : 2.9.87  
Superceeded : 3.87  
Calibrating oil : ISO-4113

Combination no. : 0 400 874 243

Injection pump  
Pump designation : PES4A90D410RS2666-2L  
EP type number : 0 410 894 033  
Governor  
Governor design. : RSV350...1200A2C1139  
-2L  
Governor no. : 0 420 232 471

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM364

1st version kW : 50.0  
Speed 1/min: 2400

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 4- 2

SD ang. spacing<sup>o</sup>CS: 0-90-180-270  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1200  
-----  
Contr.-rod trav.mm: 9.40...9.50  
-----  
Del.quantity cm3/ : 4.9...5.0  
100H.: (4.7...5.2)  
-----  
Dispersion cm3/ : 0.3  
100H.: (0.5)  
-----  
2nd speed 1/min: 350.0  
Contr.-rod trav. m: 8.1...8.7  
Del.quantity cm3/ : 1.0...1.2  
100H.: (0.8...1.4)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Contr.-rod travelmm: 0.30...0.70

Governor-spring reload  
Notch setting x : 5.00

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1200  
Del.quantity cm3/ : 49.0...50.0  
1000H.: (47.0...52.0)  
Dispersion cm3/ : 3.00  
1000H.: (5.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 49...57

Testing:  
1st c-rod trav.mm : 8.40  
Speed 1/min : 1240...1245  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1286...1299  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1325...1355  
4th speed 1/min : 1530

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 8.40

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 8.40  
C-rod trav.mm : 2.00  
Speed 1/min : 530...590

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1200  
C-rod trav.mm : 9.40...9.50  
2nd speed 1/min : 800  
C-rod trav.mm : 10.50...10.60  
3rd speed 1/min : 950  
C-rod trav.mm : 10.30...10.50  
4th speed 1/min : 1050  
C-rod trav.mm : 9.70...10.00

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 800  
Del.quantity cm3/ : 45.0...47.0  
1000H.: (42.5...49.5)  
Speed 1/min : 1000  
Del.quantity cm3/ : 48.0...51.0  
1000H.: (45.5...53.5)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 8.40  
Speed 1/min : 1240...1245

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 80.0...90.0  
1000H.: (77.0...93.0)  
Contr.-rod trav.mm: 16.20...16.60

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 8.10...8.70  
Del.quantity cm3/ : 10.0...12.0  
1000H.: (8.0...14.0)  
Dispersion cm3/ : 2.50  
1000H.: (4.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 M12  
Edition : 2.9.87  
Superceeded : 5.87  
Calibrating oil : ISO-4113

Combination no. : 0 400 876 108

Injection pump  
Pump designation : PES6A80D41ORS2085X  
EP type number : 0 410 886 045  
Governor  
Governor design. : RSV350...1400A2C  
1001L  
Governor no. : 0 420 232 464

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM352

1st version kW : 66.0  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
: (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 8.50...8.60

Del.quantity cm3/ : 4.1...4.2

100H.: (4.0...4.4)

Dispersion cm3/ : 0.2

100H.: (0.3)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 7.4...7.6

Del.quantity cm3/ : 1.0...1.4

100H.: (0.8...1.5)

Dispersion cm3/ : 0.2

100H.: (0.3)

#### SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Contr.-rod travelmm: 0.30...1.00

Governor-spring reload

Notch setting x : 4.50

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Del.quantity cm3/ : 41.5...42.5

1000H.: (40.0...44.0)

Dispersion cm3/ : 2.00

1000H.: (3.50)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 46...54

#### Testing:

1st c-rod trav.mm : 7.50

Speed 1/min : 1455...1465

2nd c-rod trav.mm : 4.00

Speed 1/min : 1475...1505

3rd c-rod trav.mm : 4.00

Speed 1/min : 1525...1555

4th speed 1/min : 1600

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 7.5

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 7.50

C-rod trav.mm : 2.00

Speed 1/min : 730...790

#### TORQUE CONTROL

Dimension a mm : 0.50

Torque-control curve - 1st version

1st speed 1/min : 1400

C-rod trav.mm : 8.50...8.60

2nd speed 1/min : 500

C-rod trav.mm : 9.80...9.90

3rd speed 1/min : 800

C-rod trav.mm : 8.80...9.10

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 40.5...42.5

1000H.: (38.5...44.5)

Speed 1/min : 800

Del.quantity cm3/ : 39.0...41.0

1000H.: (37.0...43.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 7.50

Speed 1/min : 1455...1465

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 Q17  
 Edition : 2.9.87  
 Superceeded : 12.86  
 Calibrating oil : ISO-4113

Combination no. : 0 400 876 259

Injection pump  
 Pump designation : PES6A90D41ORS2293  
 EP type number : 0 410 896 031  
 Governor  
 Governor design. : RSV350...1400AOC  
 1080L  
 Governer no. : 0 420 232 408

Customer-spec. information  
 Customer : DAIMLER BENZ

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400

Contr.-rod trav.mm: 9.70...9.80

Del.quantity cm3/ : 6.3...6.4  
 100H.: (6.1...6.6)

Dispersion cm3/ : 0.3  
 100H.: (0.4)

2nd speed 1/min: 350.0  
 Contr.-rod trav. m: 6.5...7.1  
 Del.quantity cm3/ : 1.0...1.2  
 100H.: (0.8...1.4)

Dispersion cm3/ : 0.2  
 100H.: (-)

## SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 3.50

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1400

Del.quantity cm3/ : 63.0...64.0  
 1000H.: (61.0...66.0)

Dispersion cm3/ : 3.00  
 1000H.: (4.50)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 64...72

Testing:

1st c-rod trav.mm : 8.70  
 Speed 1/min : 1440...1445

2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1473...1486

3rd c-rod trav.mm : 4.00  
 Speed 1/min : 1510...1540

4th speed 1/min : 1570  
 C-rod trav.mm : 0.30...1.40

## LOWEST RATED SPEED I

Setting point w/out aux. spring  
 Speed 1/min : 350

Contr.-rod trav.mm: 6.80

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 6.80  
C-rod trav.mm : 2.00  
Speed 1/min : 450...510

TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1400  
C-rod trav.mm : 9.70...9.80  
2nd speed 1/min : 600  
C-rod trav.mm : 9.80...10.00

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 51.0...53.0  
1000H.: (49.0...55.0)  
Speed 1/min : 850  
Del.quantity cm3/ : 56.0...58.0  
1000H.: (53.5...60.5)

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 8.70  
Speed 1/min : 1440...1445

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 15.00...15.40

LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 6.50...7.10  
Del.quantity cm3/ : 10.0...12.0  
1000H.: (8.0...14.0)  
Dispersion cm3/ : 2.00  
1000H.: (-)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 S10  
 Edition : 2.9.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 876 263  
 Injection pump  
 Pump designation : PES6A90D41ORS2293  
 EP type number : 0 410 896 031  
 Governor  
 Governor design. : RSV350...1300AOC  
 1107L  
 Governor no. : 0 420 232 415

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 352

1st version kW : 80.9  
 Speed 1/min: 2600

## TEST BENCH REQUIREMENTS

Calibrating-pil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.15...2.25  
 : (2.10...2.30)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1300

Contr.-rod trav.mm: 8.70...8.80

Del.quantity cm3/ : 5.0...5.1

100H.: (4.8...5.3)

Dispersion cm3/ : 0.3

100H.: (0.4)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.6...7.2

Del.quantity cm3/ : 1.0...1.2

100H.: (0.8...1.4)

Dispersion cm3/ : 0.2

100H.: (0.4)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...1.00

Governor-spring reload

Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1300

Del.quantity cm3/ : 50.0...51.0

1000H.: (48.0...53.0)

Dispersion cm3/ : 3.00

1000H.: (4.50)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 62...70

Testing:

1st c-rod trav.mm : 7.70

Speed 1/min : 1340...1345

2nd c-rod trav.mm : 4.00

Speed 1/min : 1370...1383

3rd c-rod trav.mm : 4.00

Speed 1/min : 1390...1420

4th speed 1/min : 1550



C-rod trav.mm : 0.30...1.70

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 350

Contr.-rod trav.mm: 6.90

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 350

C-rod trav.mm : 6.90

C-rod trav.mm : 2.00

Speed 1/min : 485...545

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1300

C-rod trav.mm : 8.70...8.80

2nd speed 1/min : 500

C-rod trav.mm : 9.90...10.00

3rd speed 1/min : 900

C-rod trav.mm : 9.10...9.30

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500

Del.quantity cm3/ : 47.5...49.5

1000H.: (45.0...52.0)

Speed 1/min : 900

Del.quantity cm3/ : 50.5...53.5

1000H.: (48.0...56.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 7.70

Speed 1/min : 1340...1345

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 78.0...88.0

1000H.: (75.0...91.0)

Contr.-rod trav.mm: 14.80...15.20

#### LOW IDLE

Speed 1/min : 350

Contr.-rod trav.mm: 6.60...7.20

Del.quantity cm3/ : 10.0...12.0

1000H.: (8.0...14.0)

Dispersion cm3/ : 2.00

1000H.: (4.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 6,1 E 3  
 Edition : 26.06.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 876 275  
 Injection pump  
 Pump designation : PES6A95D410RS2471  
 EP type number : 0 410 896 952  
 Governor  
 Governor design. : RSV325...1150A8C674L  
 Governor no. : 0 420 232 331

Customer-spec. information  
 Customer : KHD

Engine : BF6L913C

1st version kW : 132.0  
 Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 1.90...2.00  
 : (1.85...2.05)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1150  
 -----  
 Contr.-rod trav.mm: 11.80...11.90  
 -----

Del.quantity cm3/ : 10.8...11.0  
 -----  
 100H.: (10.6...11.2)  
 -----

Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.6)  
 -----

2nd speed 1/min: 325.0  
 Contr.-rod trav. m: 7.2...7.4  
 Del.quantity cm3/ : 1.6...2.2  
 100H.: (1.3...2.4)  
 Dispersion cm3/ : 0.3  
 100H.: (0.5)

## SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed 1/min: 800  
 Contr.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 4.75

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1150  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 108.0...110.0  
 1000H.: (106.0...112.0)  
 Dispersion cm3/ : 3.00  
 1000H.: (6.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 52...60

Testing:  
 1st c-rod trav.mm : 10.80  
 Speed 1/min : 1190...1200  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1235...1265  
 3rd c-rod trav.mm : 4.00  
 Speed 1/min : 1285...1315  
 4th speed 1/min : 1400

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever

position degrees: 17...25

Setting point w/out aux. spring

Speed 1/min : 325

Contr.-rod trav.mm: 6.8

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 19.50

Speed 1/min : 325

C-rod trav.mm : 6.70...6.90

C-rod trav.mm : 2.00

Speed 1/min : 585...645

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1150

C-rod trav.mm : 11.80...11.90

2nd speed 1/min : 500

C-rod trav.mm : 11.80...12.00

compensator (LDA,ADA,ALDA)

#### 1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 11.80...11.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 9.90...10.00

2nd pressure hPa : 220

C-rod trav.mm : 11.20...11.30

3rd pressure hPa : 140

C-rod trav.mm : 10.90...11.10

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 700

Speed 1/min : 850

Del.quantity cm3/ : 103.5...106.5

1000H.: (101.0...109.0)

Dispersion cm3/ : -

1000H.: (7.00)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 62.0...64.0

1000H.: (60.0...66.0)

#### SETTING CONTROL-ROD STOP

Speed 1/min : 500

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.80

Speed 1/min : 1190...1200

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 120.0...130.0

1000H.: (117.0...133.0)

Contr.-rod trav.mm: 15.50...15.90

#### Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

The stop position of the control rod must be easily reached with the stop lever

#### APPLICATION

Installation 2300

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 5,7 V 18  
 Edition : 26.06.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 400 876 293  
 Injection pump  
 Pump designation : PES6A90D41ORS2596  
 EP type number : 0 410 896 073  
 Governor  
 Governor design. : RSV350...1400AOC1141  
 L  
 Governor no. : 0 420 232 423

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM352A

1st version kW : 123.0  
 Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 014

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1400  
 -----  
 Contr.-rod trav.mm: 11.90...12.00  
 -----  
 Del.quantity cm3/ : 7.4...7.5  
 -----  
 100H.: (7.2...7.7)  
 -----  
 Dispersion cm3/ : 0.3  
 -----  
 100H.: (0.4)  
 -----  
 2nd speed 1/min: 350.0  
 Contr.-rod trav. m: 7.8...8.4  
 Del.quantity cm3/ : 1.0...1.2  
 100H.: (0.8...1.4)  
 Dispersion cm3/ : 0.2  
 100H.: (0.4)

## SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed 1/min: 800  
 Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
 Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1400  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 74.0...75.0  
 1000H.: (72.0...77.0)  
 Dispersion cm3/ : 3.00  
 1000H.: (4.50)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 66...74

Testing:  
 1st c-rod trav.mm : 10.90  
 Speed 1/min : 1435...1440  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1475...1488  
 3rd c-rod trav.mm : 4.00  
 Speed 1/min : 1520...1550

4th speed 1/min : 1680  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: -  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 8.1

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 16.00  
Speed 1/min : 350  
C-rod trav.mm : 8.00...8.20  
C-rod trav.mm : 2.00  
Speed 1/min : 580...640

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1400  
C-rod trav.mm : 11.90...12.00  
2nd speed 1/min : 900  
C-rod trav.mm : 13.00...13.10  
3rd speed 1/min : 1050  
C-rod trav.mm : 12.50...12.70  
4th speed 1/min : 1260  
C-rod trav.mm : 11.90...12.00

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 13.10...13.20

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 11.30...11.40  
2nd pressure hPa : 500  
C-rod trav.mm : 12.60...12.70  
3rd pressure hPa : 275  
C-rod trav.mm : 11.60...11.80

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 700  
Speed 1/min : 900  
Del.quantity cm3/ : 75.0...78.0  
1000H.: (72.5...80.5)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 50.0...51.0  
1000H.: (48.0...53.0)

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)  
Contr.-rod trav.mm: 16.10...16.50

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 7.80...8.40  
Del.quantity cm3/ : 10.0...12.0  
1000H.: (8.0...14.0)  
Dispersion cm3/ : 2.50  
1000H.: (4.50)

#### Remarks:

Hydraulic latching of starting  
delivery.

Latching at 0.4 bar ... 0.5 bar.

Unlatching at 0.25 bar...0.35 bar.

#### APPLICATION

Unimog

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : LIE 8,4 A  
Edition : 28.08.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 876 322  
  
Injection pump  
Pump designation : PES6A95D41ORS2689  
EP type number : 0 410 896 916  
Governor  
Governor design. : RSV400...1000A1C2187  
L  
Governor no. : 0 420 232 387

Customer-spec. information  
Customer : LIEBHERR

Engine : D906 NA

1st version kW : 112.0  
Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 000

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.70...2.80  
: (2.65...2.85)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 8.50...9.50  
Difference ° CS : 4.00...5.00

## BASIC SETTING

1st speed 1/mi: 1000

Contr.-rod trav.mm: 9.70...9.80

Del.quantity cm3/ : 8.1...8.3

100H.: (7.9...8.5)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 400.0

Contr.-rod trav. m: 6.4...6.6

Del.quantity cm3/ : 1.0...1.6

100H.: (0.7...1.8)

Dispersion cm3/ : 0.3

100H.: (0.5)

## SLEEVE POSITION

Control-lever position

Degree: -3

Speed 1/min: 800

Cont.-rod travelmm: 0.30...0.70

Governor-spring reload

Notch setting x : 4.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1000

Del.quantity cm3/ : 81.0...83.0

1000H.: (79.0...85.0)

Dispersion cm3/ : 3.50

100CH.: (6.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 46...54

Testing:

1st c-rod trav.mm : 8.70

Speed 1/min : 1040...1050

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1050...1080  
3rd c-rod trav.mm : 4.00  
Speed 1/min : 1090...1220  
4th speed 1/min : 1230  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 20...28  
Setting point w/out aux. spring  
Speed 1/min : 400  
Contr.-rod trav.mm: 6.0

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 400  
C-rod trav.mm : 6.40...6.60  
C-rod trav.mm : 2.00  
Speed 1/min : 530...590

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 9.70...9.80  
2nd speed 1/min : 500  
C-rod trav.mm : 9.70...9.90

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 70.0...73.0  
1000H.: (67.5...75.5)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 8.70  
Speed 1/min : 1040...1050

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...130.0  
1000H.: (117.0...133.0)  
Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 400  
Contr.-rod trav.mm: 6.40...6.60  
Del.quantity cm3/ : 10.0...16.0  
1000H.: (7.5...18.5)  
Dispersion cm3/ : 3.50  
1000H.: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 6,0 C  
Edition : 21.08.87  
Superceeded : 12.9.86  
Calibrating oil : ISO-4113

Combination no. : 0 400 876 331

Injection pump  
Pump designation : PES6A90D41ORS2710  
EP type number : 0 410 896 082  
Governor  
Governor design. : RSV350...1400A0C2006  
-2L  
Governer no. : 0 420 232 453

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 366

1st version kW : 100,0  
Speed 1/min: 2800

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 000

Inlet press., bar : 1.00

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values \_ \_ \_ \_

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.25...2.35  
: (2.20...2.40)



Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1380  
-----  
Contr.-rod trav.mm: 10.70...10.80  
-----  
Del.quantity cm3/ : 6.5...6.6  
-----  
100H.: (6.3...6.8)  
-----  
Dispersion cm3/ : 0.3  
-----  
100H.: (0.4)  
-----  
2nd speed 1/min: 350.0  
Contr.-rod trav. m: 8.0...8.2  
Del.quantity cm3/ : 0.6...1.0  
100H.: (0.4...1.2)  
Dispersion cm3/ : 0.2  
100H.: (0.4)

#### SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Contr.-rod travelmm: 0.30...1.00

Governor-spring reload  
Notch setting x : 4.50

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1380  
Del.quantity cm3/ : 65.0...66.0  
1000H.: (63.0...68.0)  
Dispersion cm3/ : 3.00  
1000H.: (4.50)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 57...65

#### Testing:

1st c-rod trav.mm : 9.70  
Speed 1/min : 1430...1440  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1490...1520  
4th speed 1/min : 1650  
C-rod trav.mm : 0.30...1.70

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 24...32  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 8.1

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 19.50  
Speed 1/min : 350  
C-rod trav.mm : 8.00...8.20  
C-rod trav.mm : 2.00  
Speed 1/min : 480...540

#### SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

#### TORQUE CONTROL

Torque-control curve - 1st version  
1st speed 1/min : 1380  
C-rod trav.mm : 10.70...10.80  
2nd speed 1/min : 500  
C-rod trav.mm : 11.80...11.90  
3rd speed 1/min : 900  
C-rod trav.mm : 11.30...11.50

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 53.0...55.0  
1000H.: (50.5...57.5)  
Dispersion cm3/ : -  
1000H.: (5.50)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 9.70  
Speed 1/min : 1430...1440

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 78.0...88.0  
1000H.: (75.0...91.0)

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 8.00...8.20  
Del.quantity cm3/ : 6.0...10.0  
1000H.: (4.0...12.0)  
Dispersion cm3/ : 2.50  
1000H.: (4.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 6,2 0 4  
Edition : 12.06.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 400 876 341  
  
Injection pump  
Pump designation : PES6A9SD32ORS2693  
EP type number : 0 410 896 914  
Governor  
Governor design. : RSV250...750A7C2206-1R  
Governor no. : 0 420 233 209  
  
Customer-spec. information  
Customer : DAF

Engine : DNTD620 (1500e

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 000  
  
Inlet press., bar : 1.50  
  
Calibrating nozzle-holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
: (1.95...2.15)  
Contr.-rod trav mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 8.50...9.50  
Difference ° CS : 2.50...3.50

## BASIC SETTING

1st speed 1/mi: 700  
-----  
Contr.-rod trav.mm: 11.60...11.70  
-----  
Del.quantity cm3/ : 7.0...7.2  
-----  
100H.: (6.8...7.4)  
-----  
Dispersion cm3/ : 0.3  
-----  
100H.: (0.6)  
-----  
2nd speed 1/min: 300.0  
Contr.-rod trav. m: 6.5...6.7  
Del.quantity cm3/ : 0.7...1.1  
100H.: (0.4...1.3)  
Dispersion cm3/ : 0.3  
100H.: (0.5)

## SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Cont.-rod travelmm: 0.30...0.70

Governor-spring reload  
Notch setting x : 5.25

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 700  
Del.quantity cm3/ : 70.0...72.0  
1000H.: (68.0...74.0)  
Dispersion cm3/ : 3.50  
1000H.: (6.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 43...51

Testing:  
1st c-rod trav.mm : 10.60  
Speed 1/min : 745...750  
2nd c-rod trav.mm : 4.00

Speed 1/min : 775...790  
4th speed 1/min : 935  
C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 21...29  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 6.6  
Speed 1/min : 300  
C-rod trav.mm : 6.50...6.70  
C-rod trav.mm : 2.00  
Speed 1/min : 310...370

#### SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 6.50...6.70  
Del.quantity cm3/ : 7.0...11.0  
1000H.: (4.5...13.5)  
Dispersion cm3/ : 3.50  
1000H.: (5.50)

Remarks:  
APPLICATION  
Generator

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6 Y3  
 Edition : 31.07.87  
 Superceeded : 9.3.87  
 Calibrating oil : ISO-4113  
 Combination no. : 0 401 846 510  
 Injection pump  
 Pump designation : PE6P120A32ORS415-1  
 EP type number : 0 411 826 123  
 Governor  
 Governor design. : RQ250/900PA754  
 Governor no. : 0 421 801 288

Customer-spec. information  
 Customer : DAF

Engine : DKX 1160E

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Contr.-rod trav.mm: 9.00...12.00

H04

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 600  
 -----  
 Contr.-rod trav.mm: 11.70...11.80  
 -----  
 Del.quantity cm3/ : 17.4...17.6  
 -----  
 100H.: (17.1...17.9)  
 -----  
 Dispersion cm3/ : 0.5  
 -----  
 100H.: (0.9)  
 -----  
 2nd speed 1/min: 250.0  
 Contr.-rod trav. m: 6.7...6.9  
 Del.quantity cm3/ : 1.4...2.0  
 100H.: (1.1...2.3)  
 Dispersion cm3/ : 0.8  
 100H.: (1.2)

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 850  
 Contr.-rod travelmm: 14.10...14.90

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 600  
 Charge press. hPa : 700  
 Del.quantity cm3/ : 174.0...176.0  
 1000H.: (171.0...179.0)  
 Dispersion cm3/ : 5.00  
 1000H.: (9.00)

## HIGHEST RATED SPEED

Setting point:  
 Speed 1/min : 850  
 Contr.-rod trav.mm: 14.5

Testing:  
 1st c-rod trav.mm : 10.00  
 Speed 1/min : 925...940  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 995...1025  
 4th speed 1/min : 1150  
 C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 250  
Contr.-rod trav.mm: 6.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.40  
Speed 1/min : 250  
C-rod trav.mm : 6.40...6.60  
C-rod trav.mm : 2.00  
Speed 1/min : 445...485

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque-control curve - 1st version  
1st speed 1/min : 875  
C-rod trav.mm : 11.00...11.10  
2nd speed 1/min : 600  
C-rod trav.mm : 12.00...12.20  
3rd speed 1/min : 700  
C-rod trav.mm : 11.60...11.80  
4th speed 1/min : 760  
C-rod trav.mm : 11.20...11.50

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 600  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.70...11.80

##### Measurement

Speed 1/min : 600  
1st pressure hPa : -  
C-rod trav.mm : 10.40...10.60  
2nd pressure hPa : 300  
C-rod trav.mm : 11.10...11.20  
3rd pressure hPa : 250  
C-rod trav.mm : 10.40...10.70

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 700  
Speed 1/min : 875  
Del.quantity cm3/ : 170.0...174.0  
1000H.: (167.0...177.0)  
Charge press. hPa : -  
Speed 1/min : 600  
Del.quantity cm3/ : 140.0...142.0  
1000H.: (137.0...145.0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 10.00  
Speed 1/min : 925...940

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 305.0...345.0  
1000H.: (301.0...349.0)  
Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 6.40...6.60

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : DAF 11,6 X1  
Edition : 10.08.87  
Superceeded : 9.3.87  
Calibrating oil : ISO-4113

Combination no. : 0 401 846 530

Injection pump  
Pump designation : PE6P110A32ORS407-1  
EP type number : 0 411 816 147  
Governor  
Governor design. : RQ275/1000PA818  
Governor no. : 0 421 801 360

Customer-spec. information  
Customer : DAF

Engine : LT 160

1st version kW : 160.0  
Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 12.00...12.10

Del.quantity cm3/ : 13.4...13.6

100H.: (13.1...13.8)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 7.3...7.5

Del.quantity cm3/ : 1.4...1.9

100H.: (1.1...2.1)

Dispersion cm3/ : 0.4

100H.: (0.7)

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 15.60...16.40

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 600

Del.quantity cm3/ : 134.0...136.0

1000H.: (131.5...138.5)

Dispersion cm3/ : 4.00

1000H.: (7.50)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 16.0

Testing:

1st c-rod trav.mm : 10.00

Speed 1/min : 1030...1045

2nd c-rod trav.mm : 4.00

Speed 1/min : 1090...1120

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED 1

Setting point w/out aux. spring

Speed 1/min : 275

Contr.-rod trav.mm: 7.4

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.60

Speed 1/min : 275

C-rod trav.mm : 7.30...7.50

C-rod trav.mm : 2.00

Speed 1/min : 350...390

#### TORQUE CONTROL

Dimension a mm : 0.60

Torque-control curve - 1st version

1st speed 1/min : 980

C-rod trav.mm : 11.00...11.10

2nd speed 1/min : 550

C-rod trav.mm : 12.30...12.50

3rd speed 1/min : 745

C-rod trav.mm : 11.90...12.10

4th speed 1/min : 880

C-rod trav.mm : 11.20...11.50

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 980

Del.quantity cm3/ : 112.0...116.0

1000H.: (109.0...119.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.00

Speed 1/min : 1030...1045

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 245.0...285.0

1000H.: (241.0...289.0)

Contr.-rod trav.mm: 19.50...21.00

#### LOW IDLE

Speed 1/min : 275

Contr.-rod trav.mm: 7.30...7.50

Del.quantity cm3/ : 14.0...19.0

1000H.: (11.5...21.5)

Dispersion cm3/ : 4.50

1000H.: (7.50)

Remarks:

On activation of the starting solenoid,  
the start position must be reached.

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet	: DAF 11 6M14
Edition	: 10.08.87
Superceeded	: 2.6.87
Calibrating oil	: ISO-4113
Combination no.	: 0 401 846 542
Injection pump	
Pump designation	: PE6P100A32ORS384-1
EP type number	: 0 411 806 189
Governor	
Governor design.	: RQ225/1000PA868
Governer no.	: 0 421 801 403

Customer-spec. information  
Customer : DAF

Engine : DKDL 1160 SB 220

1st version kW : 220.0  
Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

START OF DELIVERY

Test pressure, bar: 25...27

```

Prestroke mm      : 3.20...3.30
                  : (3.15...3.35)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence      : 1- 5- 3- 6- 2- 4

```

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + -<sup>o</sup>: 0.50 (0.75)

## BASIC SETTING

```

1st speed      1/mi: 600
-----
Contr.-rod trav.mm: 11.40...11.50
-----
Del.quantity cm3/ : 9.8...10.0
-----
                100H.: (9.6...10.2)

```

Dispersion    cm<sup>3</sup>/ : 0.3  
 100H. : (0.6)

```

2nd speed      1/min: 250.0
Contr.-rod trav. m: 7.5...7.7
Del.quantity   cm3/ : 0.9...1.3
                100H.: (0.6...1.5)
Dispersion     cm3/ : 0.3
                100H.: (0.5)

```

### SLEEVE POSITION

```
Control-lever position
Degree: -1
Speed      17/min: 550
Cont.-rod travelmm: 15.20...16.40
```

FULL-LOAD DELIV. AT FULL-LOAD STOP

```

1st version
Speed          1/min: 600
Del.quantity   cm3/ : 98.0...100.0
                1000H.: (96.0...102.0)
Dispersion     cm3/ : 3.50
                1000H.: (6.00)

```

## HIGHEST RATED SPEED

Setting point:  
Speed 1/min : 550  
Contr.-rod trav.mm: 15.8

```

Testing:
1st c-rod trav.mm : 9.60
  Speed    1/min : 1045...1060
2nd c-rod trav.mm : 4.00
  Speed    1/min : 1100...1130
4th speed  1/min : 1250
  C-rod trav.mm : 0.00...1.00

```



# LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 250

Contr.-rod trav.mm: 7.6

## Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.40

Speed 1/min : 250

C-rod trav.mm : 7.50...7.70

C-rod trav.mm : 2.00

Speed 1/min : 345...385

## TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 600

C-rod trav.mm : 11.40...11.50

2nd speed 1/min : 1000

C-rod trav.mm : 10.60...10.80

3rd speed 1/min : 820

C-rod trav.mm : 11.10...11.30

4th speed 1/min : 900

C-rod trav.mm : 10.80...11.10

## FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1000

Del.quantity cm3/ : 93.0...97.0

1000H.: (90.5...99.5)

## SETTING CONTROL-ROD STOP

Speed 1/min : 600

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.60

Speed 1/min : 1045...1060

## STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 180.0...220.0

1000H.: (176.0...224.0)

Contr.-rod trav.mm: 19.50...21.00

## LOW IDLE

Speed 1/min : 250

Contr.-rod trav.mm: 7.50...7.70

Del.quantity cm3/ : 9.0...13.0

1000H.: (6.5...15.5)

Dispersion cm3/ : 3.50

1000H.: (5.50)

Remarks:

H09

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,0 C 2  
Edition : 10.08.87  
Superceeded : 4.85  
Calibrating oil : ISO-4113  
Combination no. : 0 401 846 748  
Injection pump  
Pump designation : PE6P110A32OLS3805-10  
EP type number : 0 411 816 740  
Governor  
Governor design. : RQV300...1150PA524-4  
Governor no. : 0 421 813 315

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM421

1st version kW : 159.0  
Speed 1/min: 2300  
2nd version kW : 159.0  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

H10

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 3- 5- 2- 4- 1

SD ang. spacing°CS: 0-45-120-165-240-285  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 1150  
-----  
Contr.-rod trav.mm: 11.70...11.80  
-----  
Del.quantity cm3/ : 13.2...13.4  
-----  
100H.: (12.9...13.6)  
-----  
Dispersion cm3/ : 0.4  
-----  
100H.: (0.8)  
-----

2nd speed 1/min: 300.0  
Contr.-rod trav. m: 7.8...8.0  
Del.quantity cm3/ : 1.2...1.8  
100H.: (0.9...2.0)  
Dispersion cm3/ : 0.4  
100H.: (0.7)

1st speed 1/min: 1150  
Contr.-rod trav.mm: 12.5...12.6  
Del.quantity cm3/ : 12.8...13.0  
100H.: (-)  
Dispersion cm3/ : 0.4  
100H.: (0.8)

2nd speed 1/min: 300  
Contr.-rod trav.mm: 8.30...8.50  
Del.quantity cm3/ : 1.2...1.8  
100H.: (-)  
Dispersion cm3/ : 0.4  
100H.: (0.7)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300  
Sleeve travel mm: 1.60...1.80  
2nd speed 1/min: 800  
Sleeve travel mm: 5.80...6.20  
3rd speed 1/min: 1200  
Sleeve travel mm: 8.20...8.40  
4th speed 1/min: 1260  
Sleeve travel mm: 9.60...10.40

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1190

Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Del.quantity cm3/ : 132.0...134.0

1000H.: (129.5...136.5)

Dispersion cm3/ : 4.00

1000H.: (8.00)

2nd version

Speed 1/min: 1150

Del.quantity cm3/ : 128.0...130.0

1000H.: (125.0...133.0)

Dispersion cm3/ : 4.0

1000H.: (8.0)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 51...59

Testing:

1st c-rod trav.mm : 10.70

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1240...1270

4th speed 1/min : 1400

C-rod trav.mm : 0.00...1.00

2nd version

Control-lever

position degrees: 61...69

Testing:

1st c-rod trav.mm : 11.50

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1240...1270

4th speed 1/min : 1400

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 18...26

Testing:

Speed 1/min : 100

C-rod trav.mm min : 9.50

Speed 1/min : 300

C-rod trav.mm : 7.80...8.00

## CONSTANT REGULATION

Speed 1/min : 300...450

## SWITCH-OVER POINT

Speed 1/min : 220 (240)

## FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 110.0...114.0

1000H.: (107.0...117.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

Speed 1/min : 600

Del.quantity cm3/ : 120.0...124.0

1000H.: (117.0...127.0)

Dispersion cm3/ : 6.0

1000H.: (9.0)

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.70

Speed 1/min : 1190...1200

2nd version

1mm control-rod travel less than

full-load trav.mm: 11.50

Speed 1/min : 1190...1200

## STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:

See VDT-I-401/102.

Version 1: Without return-flow  
restriction

Version 2: With return-flow restriction



Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 61...69

#### Testing:

1st c-rod trav.mm : 12.30  
Speed 1/min : 1085...1095  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1150...1180  
4th speed 1/min : 1250  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 6...14

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 4.80  
Speed 1/min : 250  
C-rod trav.mm : 3.30...3.50  
C-rod trav.mm : 2.00  
Speed 1/min : 285...345

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 500  
Pressure hPa : 1200  
Contr.-rod trav.mm: 13.30...13.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 8.60...8.80  
2nd pressure hPa : 780  
C-rod trav.mm : 13.10...13.20  
3rd pressure hPa : 100  
C-rod trav.mm : 9.10...9.40

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 700  
Del.quantity cm3/ : 139.0...141.0  
1000H.: (136.0...144.0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 12.30  
Speed 1/min : 1085...1095

#### MIDDLE RATED SPEED

Contr.-rod trav.mm: 4.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...280.0  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 3.30...3.50  
Del.quantity cm3/ : 18.0...23.0  
Dispersion cm3/ : 5.00  
1000H.: (7.00)

#### Remarks:

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : VOL 12,0 I  
Edition : 24.07.87  
Superceeded : 25.9.86  
Calibrating oil : ISO-4113

Combination no. : 0 401 846 773

Injection pump  
Pump designation : PE6P120A320RS3116  
EP type number : 0 411 826 727  
Governor  
Governor design. : RQV250...1025PA657  
Governor no. : 0 421 813 368

Customer-spec. information  
Customer : VOLVO

Engine : TD 120 G

1st version    kW    : 242.7  
Speed           1/min: 2050

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

START OF DELIVERY  
Test pressure, bar: 25...27

```

Prestroke mm      : 2.60...2.70
                  : (2.55...2.75)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence      : 1- 5- 3- 6- 2- 4

```

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + -<sup>0</sup>: 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed      1/mi: 700

Contr.-rod trav.mm: 11.40...11.50

Del.quantity cm3/ : 19.6...19.8

1004.: (19.3...20.1)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.9)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5.5...5.7

Del. quantity cm3/ : 1.8...2.3  
100H.: (1.5...2.6)

Dispersion cm<sup>3</sup>/ : 0.5  
100H.: (0.7)

(B) Setting of injection pump with externally-mounted governor

**SLEEVE TRAVELS**

1st speed 1/min: 250  
Sleeve travel mm: 1.10...1.30

2nd speed 1/min: 500  
Sleeve travel mm: 4.10...4.90

3rd speed 1/min: 700  
Sleeve travel mm: 6.30...6.70

4th speed 1/min: 900  
Sleeve travel mm: 6.30...6.70

5th speed 1/min: 1025  
Sleeve travel mm: 7.30...7.80

## SLEEVE POSITION

Control-lever position  
Degree: -1

Speed 17min: 1080  
Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 700  
Charge press. hPa : 700

Del.quantity cm3/ : 196.5...198.5  
1000H.: (193.5...201.5)  
Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 58...66

Testing:  
1st c-rod trav.mm : 10.40  
Speed 1/min : 1065...1075  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1125...1155  
4th speed 1/min : 1250  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 6...14

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 7.00  
Speed 1/min : 250  
C-rod trav.mm : 5.50...5.70  
C-rod trav.mm : 2.00  
Speed 1/min : 350...410

compensator (LDA,ADA,ALDA)

1st version  
Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.40...11.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 9.00...9.10  
2nd pressure hPa : 450  
C-rod trav.mm : 11.20...11.30  
3rd pressure hPa : 170  
C-rod trav.mm : 9.30...9.60

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 700  
Del.quantity cm3/ : 151.0...153.0  
1000H.: (148.0...156.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 10.40

Speed 1/min : 1065...1075

#### MIDDLE RATED SPEED

Contr.-rod trav.mm: 4.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...270.0  
1000H.: (236.0...274.0)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 5.50...5.70  
Del.quantity cm3/ : 18.0...23.0  
1000H.: (15.0...26.0)  
Dispersion cm3/ : 5.00  
1000H.: (7.00)

Delivery-valve spring pre-tension =  
2.40...2.60 mm.  
Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9 A9  
 Edition : 18.8.87  
 Superseded : 10.85  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 036 047  
 Injection pump  
 Pump designation : PES6P120A720/3  
 LS470-3  
 EP type number : 0 412 026 051  
 Governor  
 Governor design. : RQ250/1100PA679  
 Governor no. : 0 421 801 228

Customer-spec. information  
 Customer : MAN

Engine : D2866KUL

1st version kW : 265.0  
 Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6,00x1,50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2,80...2,90  
 : (2,75...2,95)  
 Contr.-rod trav.mm: 9,00...12,00  
 Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0,50 (0,75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 750

Contr.-rod trav.mm: 12,70...12,80

Del.quantity cm3/ : 23,0...23,2  
 100H.: (22,7...23,5)

Dispersion cm3/ : 0,5  
 100H.: (0,9)

2nd speed 1/min: 250,0  
 Contr.-rod trav. m: 5,6...5,8  
 Del.quantity cm3/ : 1,2...1,8  
 100H.: (0,9...2,1)  
 Dispersion cm3/ : 0,8  
 100H.: (1,2)

## SLEEVE POSITION

Control-lever position  
 Degree: 45...47  
 Speed 1/min: 600  
 Contr.-rod travelmm: 19,20...20,80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 750  
 Charge press. hPa : 1000  
 Del.quantity cm3/ : 230,0...232,0  
 1000H.: (227,0...235,0)  
 Dispersion cm3/ : 5,0  
 1000H.: (9,0)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: -

Setting point:  
 Speed 1/min : 600  
 Contr.-rod trav.mm: 20,0

Testing:



1st c-rod trav.mm : 10,90  
Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4,00  
Speed 1/min : 1185...1215  
4th speed 1/min : 1350  
C-rod trav.mm : 0,00...1,00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 8...16  
Setting point w/out aux. spring  
Speed 1/min : 250  
Contr.-rod trav.mm: 5,7

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7,20  
Speed 1/min : 250  
C-rod trav.mm : 5,70  
C-rod trav.mm : 2,00  
Speed 1/min : 330...370

#### TORQUE CONTROL

Dimension a mm : 0.40  
Torque-control curve - 1st version  
1st speed 1/min : 750  
C-rod trav.mm : 13,00...13,10  
2nd speed 1/min : 1100  
C-rod trav.mm : 11,90...12,00  
3rd speed 1/min : 965  
C-rod trav.mm : 12,60...12,80  
4th speed 1/min : 1010  
C-rod trav.mm : 12,30...12,60

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 1000  
Contr.-rod trav.mm: 12,70...12,80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 9,40...9,50  
2nd pressure hPa : 130  
C-rod trav.mm : 9,70...9,80  
3rd pressure hPa : 400  
C-rod trav.mm : 11,10...11,50

#### SWITCH-OVER POINT

Speed 1/min : 190 (210)

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 1000  
Speed 1/min : 1100  
Del.quantity cm3/ : 219,0...223,0  
1000H.: (216,0...226,0)  
Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 231,0...237,0  
1000H.: (228,0...240,0)  
Charge press. hPa : 400  
Speed 1/min : 500  
Del.quantity cm3/ : 179,0...191,0  
1000H.: (176,0...194,0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 128,0...130,0  
1000H.: (125,0...133,0)

#### ROTATIONAL-SPEED LIMITATION

#### 1st version

1mm control-rod travel less than

full-load trav.mm: 10,90  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225,0...245,0  
1000H.: (221,0...249,0)

#### LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 5,60...5,80  
Del.quantity cm3/ : 12,0...18,0  
1000H.: (9,0...21,0)  
Dispersion cm3/ : 8,0  
1000H.: (12,0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A26  
Edition : 31.07.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 402 036 049  
Injection pump  
Pump designation : PES6P120A720/3LS470-  
2  
EP type number : 0 412 026 050  
Governor  
Governor design. : RQ300/1100PA658-23  
Governor no. : 0 421 801 391

Customer-spec. information  
Customer : MAN

Engine : D2866MUH

1st version kW : 265.0  
Speed 1/min: 2200

### TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 750  
-----  
Contr.-rod trav.mm: 12.50...12.60  
-----  
Del.quantity cm3/ : 23.8...24.0  
                  100H.: (23.5...24.3)  
-----  
Dispersion cm3/ : 0.5  
                  100H.: (0.9)  
-----  
2nd speed 1/min: 300.0  
Contr.-rod trav. m: 4.8...5.0  
Del.quantity cm3/ : 1.2...1.8  
                  100H.: (0.9...2.1)  
Dispersion cm3/ : 0.8  
                  100H.: (1.2)

#### SLEEVE POSITION

Control-lever position  
Degree: 45...47  
Speed 1/min: 600  
Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 750  
Charge press. hPa : 1000  
Del.quantity cm3/ : 238.0...240.0  
                  1000H.: (235.0...243.0)  
Dispersion cm3/ : 5.00  
                  1000H.: (9.00)

#### HIGHEST RATED SPEED

Setting point:  
Speed 1/min : 600  
Contr.-rod trav.mm: 20.0

Testing:  
1st c-rod trav.mm : 10.30  
Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00

Speed 1/min : 1180...1210  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 7...15  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 4.9

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.40  
Speed 1/min : 300  
C-rod trav.mm : 4.90  
C-rod trav.mm : 2.00  
Speed 1/min : 345...385

#### TORQUE CONTROL

Dimension a mm : 0.65  
Torque-control curve - 1st version  
1st speed 1/min : 750  
C-rod trav.mm : 12.60...12.90  
2nd speed 1/min : 1100  
C-rod trav.mm : 11.30...11.40  
3rd speed 1/min : 935  
C-rod trav.mm : 12.10...12.50  
4th speed 1/min : 990  
C-rod trav.mm : 11.80...12.10

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 1000  
Contr.-rod trav.mm: 12.50...12.60

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 8.60...8.70  
2nd pressure hPa : 190  
C-rod trav.mm : 8.90...9.00  
3rd pressure hPa : 520  
C-rod trav.mm : 11.10...11.40

#### SWITCH-OVER POINT

Speed 1/min : 190 (210)

#### FUEL-DELIVERY CHARACTERISTICS

1st version  
Charge press. hPa : 1000  
Speed 1/min : 1100

Del.quantity cm3/ : 213.0...219.0  
1000H.: (210.0...222.0)  
Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 239.0...245.0  
1000H.: (236.0...248.0)  
Charge press. hPa : 520  
Speed 1/min : 500  
Del.quantity cm3/ : 188.0...200.0  
1000H.: (185.0...203.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 115.0...117.0  
1000H.: (112.0...120.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 10.30  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225.0...245.0  
1000H.: (221.0...249.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 4.80...5.00  
Del.quantity cm3/ : 12.0...18.0  
1000H.: (9.0...21.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A25  
Edition : 22.05.87  
Superceeded : 12.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 036 050  
  
Injection pump  
Pump designation : PES6P120A720/3LS470-  
2  
EP type number : 0 412 026 050  
Governor  
Governor design. : RQ300...1100PA684-3  
Governor no. : 0 421 801 356

Customer-spec. information  
Customer : MAN

Engine : D2866KF/K

1st version kW : 265.0  
Speed 1/min: 2200

### TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

### START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 750

Contr.-rod trav.mm: 12.20...12.30

Del.quantity cm3/ : 22.8...23.0

100H.: (22.5...23.3)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 4.7...4.9

Del.quantity cm3/ : 1.2...1.8

100H.: (0.9...2.1)

Dispersion cm3/ : 0.8

100H.: (1.2)

#### SLEEVE POSITION

Control-lever position

Degree: 45...47

Speed 1/min: 600

Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 750

Charge press. hPa : 1000

Del.quantity cm3/ : 228.0...230.0

1000H.: (225.0...233.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 20.0

Testing:

1st c-rod trav.mm : 10.20

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1180...1210

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 4.8

Testing:

Speed 1/min : 100

C-rod trav.mm min : 6.30

Speed 1/min : 300

C-rod trav.mm : 4.80

C-rod trav.mm : 2.00

Speed 1/min : 345...405

#### TORQUE CONTROL

Dimension a mm : 0.55

Torque-control curve - 1st version

1st speed 1/min : 750

C-rod trav.mm : 12.50...12.70

2nd speed 1/min : 1100

C-rod trav.mm : 11.20...11.30

3rd speed 1/min : 935

C-rod trav.mm : 12.00...12.30

4th speed 1/min : 990

C-rod trav.mm : 11.60...11.90

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 12.20...12.30

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 9.30...9.50

2nd pressure hPa : 120

C-rod trav.mm : 9.60...9.70

3rd pressure hPa : 400

C-rod trav.mm : 11.00...11.40

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 1000

Speed 1/min : 1100

Del.quantity cm3/ : 210.0...214.0

1000H.: (207.0...217.0)

Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 228.0...234.0  
1000H.: (225.0...237.0)  
Charge press. hPa : 400  
Speed 1/min : 500  
Del.quantity cm3/ : 188.0...200.0  
1000H.: (185.0...203.0)  
Speed 1/min : 500  
Del.quantity cm3/ : 139.0...141.0  
1000H.: (136.0...144.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 10.20  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225.0...245.0  
1000H.: (221.0...249.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 4.70...4.90  
Del.quantity cm3/ : 12.0...18.0  
1000H.: (9.0...21.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:  
: MAN-NR. 2-7598

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A16  
Edition : 18.8.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 036 059  
  
Injection pump  
Pump designation : PES6P120A720/3  
LS470-2  
EP type number : 0 412 026 050  
Governor  
Governor design. : RQV300...1100PA669-1  
Governor no. : 0 421 813 534

Customer-spec. information  
Customer : MAN

Engine : D2866KUHk

1st version kW : 265.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6,00x1,50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32



Prestroke mm : 2,80...2,90  
                  : (2,75...2,95)  
Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - <sup>o</sup> : 0,50 (0,75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 750

Contr.-rod trav.mm: 12,50...12,60

Del.quantity cm3/ : 23,8...24,0

100H.: (23,5...24,3)

Dispersion cm3/ : 0,5

100H.: (0,9)

2nd speed 1/min: 250

Contr.-rod trav. m: 4,80...5,00

Del.quantity cm3/ : 1,2...1,8

100H.: (0,9...2,1)

Dispersion cm3/ : 0,8

100H.: (1,2)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1,70...2,00

2nd speed 1/min: 850

Sleeve travel mm: 6,00...6,20

3rd speed 1/min: 1100

Sleeve travel mm: 8,10...8,30

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1130

Contr.-rod travelmm: 15,20...17,80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 750

Charge press. hPa : 1000

Del.quantity cm3/ : 238,0...240,0

1000H.: (235,0...243,0)

Dispersion cm3/ : 5,0

1000H.: (9,0)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 60...68

Testing:

1st c-rod trav.mm : 10,30

Speed 1/min : 1140...1150

2nd c-rod trav.mm : 4,00

Speed 1/min : 1225...1255

4th speed 1/min : 1350

C-rod trav.mm : 0,00...1,00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 6...14

Testing:

Speed 1/min : 100

C-rod trav.mm min : 6,40

Speed 1/min : 300

C-rod trav.mm : 4,80...5,00

C-rod trav.mm : 2,00

Speed 1/min : 360...420

#### TORQUE CONTROL

Dimension a mm : 1,15

Torque-control curve - 1st version

1st speed 1/min : 750

C-rod trav.mm : 12,50...12,60

2nd speed 1/min : 1100

C-rod trav.mm : 11,30...11,40

3rd speed 1/min : 900

C-rod trav.mm : 12,10...12,30

4th speed 1/min : 1000

C-rod trav.mm : 11,50...11,80

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 12,50...12,60

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 8,60...8,70

2nd pressure hPa : 190

C-rod trav.mm : 8,90...9,00

3rd pressure hPa : 520

C-rod trav.mm : 11,10...11,40

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

## FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 1000

Speed 1/min : 1100

Del.quantity cm3/ : 213,0...219,0

1000H.: (210,0...222,0)

Charge press. hPa : 1000

Speed 1/min : 650

Del.quantity cm3/ : 239,0...245,0

1000H.: (236,0...248,0)

Charge press. hPa : 520

Speed 1/min : 500

Del.quantity cm3/ : 188,0...200,0

1000H.: (188,0...200,0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 115,0...117,0

1000H.: (112,0...120,0)

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10,30

Speed 1/min : 1140...1150

## STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 225,0...245,0

1000H.: (221,0...249,0)

## LOW IDLE

Speed 1/min : 250

Contr.-rod trav.mm: 4,80...5,00

Del.quantity cm3/ : 12,0...18,0

1000H.: (9,0...21,0)

Dispersion cm3/ : 8,0

1000H.: (12,0)

Remarks:

: MAN-NR. 2-7734

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A22  
Edition : 18.8.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 402 036 061  
Injection pump  
Pump designation : PES6P120A720/3  
LS470-2  
EP type number : 0 412 026 050  
Governor  
Governor design. : RQV300...1100PA700-2  
Governor no. : 0 421 813 543

Customer-spec. information  
Customer : MAN

Engine : D2866LFZ/290

1st version kW : 213,0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6,00X1,50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2,80...2,90  
: (2,75...2,95)  
Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0,50 (0,75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 750

Contr.-rod trav.mm: 10,30...10,40

Del.quantity cm3/ : 18,3...18,5

100H.: (18,0...18,8)

Dispersion cm3/ : 0,5

100H.: (0,9)

2nd speed 1/min: 300,0

Contr.-rod trav. m: 4,8...5,0

Del.quantity cm3/ : 1,2...1,8

100H.: (0,9...2,1)

Dispersion cm3/ : 0,8

100H.: (1,2)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1,50...1,70

2nd speed 1/min: 850

Sleeve travel mm: 5,70...6,00

3rd speed 1/min: 1100

Sleeve travel mm: 8,00...8,20

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1130

Contr.-rod travelmm: 15,20...17,80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 750

Charge press. hPa : 1000

Del.quantity cm3/ : 183,0...185,0

1000H.: (180,0...188,0)

Dispersion cm3/ : 5,0

1000H.: (9,0)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 62...70

### Testing:

1st c-rod trav.mm : 8,70

Speed 1/min : 1140...1150

2nd c-rod trav.mm : 4,00

Speed 1/min : 1205...1235

4th speed 1/min : 1350

C-rod trav.mm : 0,00...1,00

## LOWEST RATED SPEED I

Control-lever

position degrees: 7...15

### Testing:

Speed 1/min : 100

C-rod trav.mm min : 6,40

Speed 1/min : 300

C-rod trav.mm : 4,80...5,00

C-rod trav.mm : 2,00

Speed 1/min : 375...435

## TORQUE CONTROL

Dimension a mm : 0,65

Torque-control curve - 1st version

1st speed 1/min : 750

C-rod trav.mm : 10,30...10,40

2nd speed 1/min : 1100

C-rod trav.mm : 9,70...9,80

3rd speed 1/min : 850

C-rod trav.mm : 10,20...10,30

4th speed 1/min : 925

C-rod trav.mm : 9,90...10,10

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 10,30...10,40

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 8,90...9,10

2nd pressure hPa : 85

C-rod trav.mm : 9,30...9,40

3rd pressure hPa : 160

C-rod trav.mm : 9,80...10,20

## SWITCH-OVER POINT

Speed 1/min : 220 (240)

J05

## FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 1000

Speed 1/min : 1100

Del.quantity cm3/ : 178,0...182,0

1000H.: (175,0...185,0)

Charge press. hPa : 1000

Speed 1/min : 650

Del.quantity cm3/ : 174,0...180,0

1000H.: (171,0...183,0)

Charge press. hPa : 160

Speed 1/min : 500

Del.quantity cm3/ : 157,0...169,0

1000H.: (154,0...172,0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 132,0...134,0

1000H.: (129,0...137,0)

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 8,70

Speed 1/min : 1140...1150

## STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 225,0...245,0

1000H.: (221,0...249,0)

## LOW IDLE

Speed 1/min : 300

Contr.-rod trav.mm: 4,80...5,00

Del.quantity cm3/ : 12,0...18,0

1000H.: (9,0...21,0)

Dispersion cm3/ : 8,0

1000H.: (12,0)

Remarks:

: MAN-NR. 2-7761

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A24  
Edition : 31.07.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 036 062  
  
Injection pump  
Pump designation : PES6P120A720/3LS470-  
2  
EP type number : 0 412 026 050  
Governor  
Governor design. : RQ300/1100PA813  
Governor no. : 0 421 801 358

Customer-spec. information  
Customer : MAN

Engine : D2866LF

1st version kW : 243.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values ----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 750

Contr.-rod trav.mm: 11.30...11.40

Del.quantity cm3/ : 20.7...20.9

100H.: (20.4...21.2)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 4.7...4.9

Del.quantity cm3/ : 1.2...1.8

100H.: (0.9...2.1)

Dispersion cm3/ : 0.8

100H.: (1.2)

#### SLEEVE POSITION

Control-lever position

Degree: 45...47

Speed 1/min: 600

Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 750

Charge press. hPa : 1000

Del.quantity cm3/ : 207.0...209.0

1000H.: (204.0...212.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 20.0

Testing:

1st c-rod trav.mm : 9.70

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1180...1210

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 4.8

Testing:

Speed 1/min : 100

C-rod trav.mm min : 6.30

Speed 1/min : 300

C-rod trav.mm : 4.80

C-rod trav.mm : 2.00

Speed 1/min : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.50

Torque-control curve - 1st version

1st speed 1/min : 750

C-rod trav.mm : 12.00...12.30

2nd speed 1/min : 1100

C-rod trav.mm : 10.70...10.80

3rd speed 1/min : 900

C-rod trav.mm : 11.70...11.90

4th speed 1/min : 975

C-rod trav.mm : 11.00...11.30

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 11.30...11.40

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 8.90...9.10

2nd pressure hPa : 85

C-rod trav.mm : 9.30...9.40

3rd pressure hPa : 280

C-rod trav.mm : 10.50...10.90

#### SWITCH-OVER POINT

Speed 1/min : 190 (210)

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 1000

Speed 1/min : 1100

Del.quantity cm3/ : 203.0...207.0

1000H.: (200.0...210.0)

Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 206.0...212.0  
1000H.: (203.0...215.0)  
Charge press. hPa : 280  
Speed 1/min : 500  
Del.quantity cm3/ : 184.0...196.0  
1000H.: (181.0...199.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 132.0...134.0  
1000H.: (129.0...137.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 9.70  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225.0...245.0  
1000H.: (221.0...249.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 4.70...4.90  
Del.quantity cm3/ : 12.0...18.0  
1000H.: (9.0...21.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9 G6  
Edition : 18.8.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 036 064  
  
Injection pump  
Pump designation : PES6P110A720/3  
LS477-2  
EP type number : 0 412 016 071  
Governor  
Governor design. : RQ250/1100PA817-1  
Governor no. : 0 421 801 362

Customer-spec. information  
Customer : MAN

Engine : D2866UH/200

1st version kW : 150.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6,00X1,50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3,50...3,60  
: (3,45...3,65)



Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD eng. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0,50 (0,75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 10,50...10,60

Del.quantity cm3/ : 9,1...9,4

100H.: (8,8...9,6)

Dispersion cm3/ : 0,4

100H.: (0,7)

2nd speed 1/min: 250,0

Contr.-rod trav, m: 6,1...6,3

Del.quantity cm3/ : 1,5...2,0

100H.: (1,2...2,2)

Dispersion cm3/ : 0,4

100H.: (0,7)

#### SLEEVE POSITION

Control-lever position

Degree: 45...47

Speed 1/min: 600

Contr.-rod travelmm: 19,20...20,80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 800

Del.quantity cm3/ : 91,0...94,0

1000H.: (88,5...96,5)

Dispersion cm3/ : 4,0

1000H.: (7,5)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 20,0

Testing:

1st c-rod trav.mm : 9,50

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4,00

Speed 1/min : 1215...1245

4th speed 1/min : 1300

C-rod trav.mm : 0,00...1,00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 8...16

Setting point w/out aux. spring

Speed 1/min : 250

Contr.-rod trav.mm: 6,20

Testing:

Speed 1/min : 100

C-rod trav.mm min : 7,70

Speed 1/min : 250

C-rod trav.mm : 6,20

C-rod trav.mm : 2,00

Speed 1/min : 320...360

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1100

C-rod trav.mm : 10,50...10,60

2nd speed 1/min : 500

C-rod trav.mm : 10,50...10,70

#### SWITCH-OVER POINT

Speed 1/min : 170 (190)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1100

Del.quantity cm3/ : 101,0...109,0

1000H.: (98,0...112,0)

Speed 1/min : 500

Del.quantity cm3/ : 77,0...85,0

1000H.: (74,0...88,0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9,50

Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 110,0...130,0

1000H.: (106,0...134,0)

#### LOW IDLE

Speed 1/min : 250

Contr.-rod trav.mm: 6,10...6,30

Del.quantity cm3/ : 15,0...20,0

1000H.: (12,5...22,5)

Dispersion cm3/ : 4,5

1000H.: (7,5)

Remarks:

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11.9 B1  
Edition : 18.8.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 402 036 065  
Injection pump  
Pump designation : PES6P110A720/3  
LS477-2  
EP type number : 0 412 016 071  
Governor  
Governor design. : RQV300...1100PA831  
Governor no. : 0 421 813 574

Customer-spec. information  
Customer : MAN

Engine : D2866 F

1st version kW : 177.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm3/ : 12.3...12.6

100H.: (12.0...12.8)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/ : 1.5...2.0

100H.: (1.2...2.2)

Dispersion cm3/ : 0.4

100H.: (0.7)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.10...1.30

2nd speed 1/min: 450

Sleeve travel mm: 3.00...3.40

3rd speed 1/min: 900

Sleeve travel mm: 6.00...6.30

4th speed 1/min: 1100

Sleeve travel mm: 7.70...7.90

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1170

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 800

Del.quantity cm3/ : 123.0...126.0

1000H.: (120.5...128.5)

Dispersion cm3/ : 4.0

1000H.: (7.5)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 49...57

Testing:  
1st c-rod trav.mm : 10.70  
Speed 1/min : 1140...1150  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1230...1260  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I  
Control-lever  
position degrees: 16...24

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 7.50  
Speed 1/min : 300  
C-rod trav.mm : 5.90...6.10

CONSTANT REGULATION  
Speed 1/min : 300...395

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS  
Speed 1/min : 1100  
Del.quantity cm3/ : 127.0...133.0  
1000H.: (124.0...136.0)  
Speed 1/min : 500  
Del.quantity cm3/ : 115.0...121.0  
1000H.: (112.0...124.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 10.70  
Speed 1/min : 1140...1150

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 110.0...130.0  
1000H.: (106.0...134.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 5.90...6.10  
Del.quantity cm3/ : 15.0...20.0  
1000H.: (12.5...22.5)  
Dispersion cm3/ : 4.5  
1000H.: (7.5)

Remarks:

: MAN-NR. 2-7723

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9 G7  
 Edition : 18.8.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 036 066  
 Injection pump  
 Pump designation : PES6P110A720/3  
 LS477-2  
 EP type number : 0 412 016 071  
 Governor  
 Governor design. : RQ250/1100PA845  
 Governor no. : 0 421 801 380

Customer-spec. information  
 Customer : MAN

Engine : D2866 F

1st version kW : 177.0  
 Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness : 6.00X1.50X600  
 x Length mm

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values \_\_\_\_\_

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - <sup>o</sup> : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm3/ : 12.3...12.6

100H.: (12.0...12.8)

Dispersion cm3/ : 0.4

100H.: (0.7)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5,90...6,10

Del.quantity cm3/ : 1.5...2.0

100H.: (1.2...2.2)

Dispersion cm3/ : 0.4

100H.: (0.7)

#### SLEEVE POSITION

Control-lever position

Degree: 45...47

Speed 1/min: 600

Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 800

Del.quantity cm3/ : 123.0...126.0

1000H.: (120.5...128.5)

Dispersion cm3/ : 4.0

1000H.: (7.5)

#### HIGHEST RATED SPEED

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 20.0

Testing:

1st c-rod trav.mm : 10.70

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00

Speed 1/min : 1220...1250

4th speed 1/min : 1350

C-rod trav.mm : 115.0...123,0

#### LOWEST RATED SPEED I

Control-lever

position degrees: 8...16

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 6.0

Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.50

Speed 1/min : 300

C-rod trav.mm : 6.00

C-rod trav.mm : 2.00

Speed 1/min : 320...360

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 850

C-rod trav.mm : 12.20...12.30

2nd speed 1/min : 1100

C-rod trav.mm : 12.10...12.30

#### SWITCH-OVER POINT

Speed 1/min : 170 (190)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1100

Del.quantity cm3/ : 127.0...133.0

1000H.: (124.0...136.0)

Speed 1/min : 500

Del.quantity cm3/ : 115.0...121.0

1000H.: (112.0...124.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.70

Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 110.0...130.0

1000H.: (106.0...134.0)

#### LOW IDLE

Speed 1/min : 250

Contr.-rod trav.mm: 5,90...6,10

Del.quantity cm3/ : 15.0...20.0

1000H.: (12.5...22.5)

Dispersion cm3/ : 4.5

1000H.: (7.5)

Remarks:

: MAN-NR. 2-7821

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9 B2  
Edition : 18.8.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 036 067  
  
Injection pump  
Pump designation : PES6P110A720/3  
LS477-2  
EP type number : 0 412 016 071  
Governor  
Governor design. : RQV300...1100PA846  
Governor no. : 0 421 813 593

Customer-spec. information  
Customer : MAN

Engine : D 2866 F

1st version kW : 177.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values \_\_\_\_\_

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3,50...3,60  
: (3,45...3,65)

Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 6-2-4-1-5-3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0,50 (0,75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 11,70...11,80

Del.quantity cm3/ : 12,3...12,6

100H.: (12,0...12,8)

Dispersion cm3/ : 0,40

100H.: 0,75

2nd speed 1/min: 300

Contr.-rod trav. m: 5,90...6,10

Del.quantity cm3/ : 1,5...2,0

100H.: (1,2...2,2)

Dispersion cm3/ : 0,45

100H.: (0,75)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1,10...1,30

2nd speed 1/min: 450

Sleeve travel mm: 2,90...3,30

3rd speed 1/min: 900

Sleeve travel mm: 5,80...6,20

4th speed 1/min: 1100

Sleeve travel mm: 7,50...7,70

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1170

Contr.-rod travelmm: 15,20...17,80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

##### 1st version

Speed 1/min: 800

Del.quantity cm3/ : 123,0...126,0

1000H.: (120,5...128,5)

Dispersion cm3/ : 4,0

1000H.: (7,5)

#### HIGHEST RATED SPEED

##### 1st version

Control-lever

position degrees: 48...56

##### Testing:

1st c-rod trav.mm : 10,70

Speed 1/min : 1140...1150

2nd c-rod trav.mm : 4,00

Speed 1/min : 1240...1270

4th speed 1/min : 1350

C-rod trav.mm : 0,00...1,00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 15...25

##### Testing:

Speed 1/min : 100

C-rod trav.mm min : 7,50

Speed 1/min : 300

C-rod trav.mm : 5,90...6,10

#### CONSTANT REGULATION

Speed 1/min : 305...460

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 1100

Del.quantity cm3/ : 127,0...133,0

1000H.: (124,0...136,0)

Speed 1/min : 500

Del.quantity cm3/ : 115,0...121,0

1000H.: (112,0...124,0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 10,70

Speed 1/min : 1140...1150

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 110,0...130,0

1000H.: (106,0...134,0)

#### LOW IDLE

Speed 1/min : 300

Contr.-rod trav.mm: 5,90...6,10

Del.quantity cm3/ : 15,0...20,0

1000H.: (12,5...22,5)

Dispersion cm3/ : 4,5

1000H.: (7,5)



Remarks:

: MAN-NR. 2-7822

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A27  
 Edition : 09.03.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 036 068  
 Injection pump  
 Pump designation : PES6P120A720/3LS470-  
 2  
 EP type number : 0 412 026 050  
 Governor  
 Governor design. : RQ300/1100PA658-22  
 Governor no. : 0 421 801 389

Customer-spec. information  
 Customer : MAN

Engine : D2866T0H

1st version kW : 213.0  
 Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 750  
-----  
Contr.-rod trav.mm: 10.60...10.70  
-----  
Del.quantity cm3/ : 19.1...19.3  
                  100H.: (18.8...19.6)  
-----  
Dispersion cm3/ : 0.5  
                  100H.: (0.9)  
-----  
2nd speed 1/min: 300.0  
Contr.-rod trav. m: 4.7...4.9  
Del.quantity cm3/ : 1.2...1.8  
                  100H.: (0.9...2.1)  
Dispersion cm3/ : 0.8  
                  100H.: (1.2)

#### SLEEVE POSITION

Control-lever position  
Degree: 45...47  
Speed 1/min: 650  
Contr.-rod travelmm: 19.20...20.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 750  
Charge press. hPa : 1000  
Del.quantity cm3/ : 191.0...193.0  
                  1000H.: (188.0...196.0)  
Dispersion cm3/ : 5.00  
                  1000H.: (9.00)

#### HIGHEST RATED SPEED

Setting point:  
Speed 1/min : 650  
Contr.-rod trav.mm: 20.0

Testing:  
1st c-rod trav.mm : 9.30  
Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00

Speed 1/min : 1180...1210  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 7...15  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 4.8

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.30  
Speed 1/min : 300  
C-rod trav.mm : 4.80  
C-rod trav.mm : 2.00  
Speed 1/min : 340...380

#### TORQUE CONTROL

Dimension a mm : 0.30  
Torque-control curve - 1st version  
1st speed 1/min : 750  
C-rod trav.mm : 11.10...11.20  
2nd speed 1/min : 1100  
C-rod trav.mm : 10.30...10.40  
3rd speed 1/min : 980  
C-rod trav.mm : 10.80...11.00  
4th speed 1/min : 1025  
C-rod trav.mm : 10.40...10.70

\*compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 1000  
Contr.-rod trav.mm: 10.30...10.40

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 8.80...8.90  
2nd pressure hPa : 240  
C-rod trav.mm : 9.10...9.20  
3rd pressure hPa : 520  
C-rod trav.mm : 10.00...10.40

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

1st version  
Charge press. hPa : 1000  
Speed 1/min : 1100

Del.quantity cm3/ : 193.0...197.0  
1000H.: (190.0...200.0)  
Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 184.0...190.0  
1000H.: (181.0...193.0)  
Charge press. hPa : 520  
Speed 1/min : 500  
Del.quantity cm3/ : 168.0...180.0  
1000H.: (165.0...183.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 128.0...130.0  
1000H.: (125.0...133.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 9.30  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225.0...245.0  
1000H.: (221.0...249.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 4.70...4.90  
Del.quantity cm3/ : 12.0...18.0  
1000H.: (9.0...21.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:  
: MAN-NR. 2-7820

APPLICATION  
Omnibus



Speed 1/min : 1180...1210  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 6...14  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 5.1

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.60  
Speed 1/min : 300  
C-rod trav.mm : 5.10  
C-rod trav.mm : 2.00  
Speed 1/min : 345...385

#### TORQUE CONTROL

Dimension a mm : 0.20  
Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 10.60...10.70  
2nd speed 1/min : 750  
C-rod trav.mm : 11.20...11.40  
3rd speed 1/min : 925  
C-rod trav.mm : 10.70...11.00

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 1000  
Contr.-rod trav.mm: 10.60...10.70

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 8.80...9.00  
2nd pressure hPa : 210  
C-rod trav.mm : 9.10...9.20  
3rd pressure hPa : 375  
C-rod trav.mm : 9.90...10.20

#### SWITCH-OVER POINT

Speed 1/min : 190 (210)

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 1000  
Speed 1/min : 1100  
Del.quantity cm3/ : 190.0...196.0  
1000H.: (187.0...199.0)

Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 174.0...180.0  
1000H.: (171.0...183.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 119.0...121.0  
1000H.: (116.0...124.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 9.60  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225.0...245.0  
1000H.: (221.0...249.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 5.00...5.20  
Del.quantity cm3/ : 12.0...18.0  
1000H.: (9.0...21.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9A29  
Edition : 26.06.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 036 070  
  
Injection pump  
Pump designation : PES6P120A720/3LS470-  
3  
EP type number : 0 412 026 051  
Governor  
Governor design. : RQV300...1100PA707-2  
Governor no. : 0 421 813 638

Customer-spec. information  
Customer : MAN

Engine : D2866LUL/290

1st version kW : 213.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 750  
-----  
Contr.-rod trav.mm: 10.60...10.70  
-----  
Del.quantity cm3/ : 18.3...18.5  
                  100H.: (18.0...18.8)  
-----  
Dispersion cm3/ : 0.5  
                  100H.: (0.9)  
-----  
2nd speed 1/min: 250.0  
Contr.-rod trav. m: 5.2...5.4  
Del.quantity cm3/ : 1.2...1.8  
                  100H.: (0.9...2.1)  
Dispersion cm3/ : 0.8  
                  100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 300  
Sleeve travel mm: 1.60...1.80  
2nd speed 1/min: 475  
Sleeve travel mm: 3.10...3.50  
3rd speed 1/min: 850  
Sleeve travel mm: 5.50...5.90  
4th speed 1/min: 1100  
Sleeve travel mm: 7.40...7.60

#### SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1175  
Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 750  
Charge press. hPa : 1000  
Del.quantity cm3/ : 183.0...185.0  
                  1000H.: (180.0...188.0)

Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 48...56

#### Testing:

1st c-rod trav.mm : 9.60  
Speed 1/min : 1140...1150  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1225...1255  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 15...23

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.80  
Speed 1/min : 300  
C-rod trav.mm : 5.20...5.40

#### CONSTANT REGULATION

Speed 1/min : 310...410

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 500  
Pressure hPa : 1000  
Contr.-rod trav.mm: 10.60...10.70

##### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 8.80...8.90  
2nd pressure hPa : 210  
C-rod trav.mm : 9.10...9.20  
3rd pressure hPa : 375  
C-rod trav.mm : 9.90...10.20

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 1000  
Speed 1/min : 1100  
Del.quantity cm3/ : 192.0...198.0  
                  1000H.: (189.0...201.0)



Charge press. hPa : 1000  
Speed 1/min : 650  
Del.quantity cm3/ : 172.0...178.0  
1000H.: (169.0...181.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 119.0...121.0  
1000H.: (116.0...124.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 9.60  
Speed 1/min : 1140...1150

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 225.0...245.0  
1000H.: (221.0...249.0)

#### LOW IDLE

Speed 1/min : 250  
Contr.-rod trav.mm: 5.20...5.40  
Del.quantity cm3/ : 12.0...18.0  
1000H.: (9.0...21.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 9,5 A3  
Edition : 09.03.87  
Superceeded : 11.85  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 045 024  
  
Injection pump  
Pump designation : PESSP110A820LS434  
EP type number : 0 412 015 020  
Governor  
Governor design. : RQV300...1100PA594-1  
Governor no. : 0 421 813 336

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM409

1st version kW : 135.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
                  : (2.95...3.15)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 3- 5- 4- 2

SD ang. spacing<sup>o</sup>CS: 0-72-144-216-288  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 5

#### BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 11.0...11.2

100H.: (10.7...11.5)

Dispersion cm3/ : 0.4

100H.: (0.8)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 8.10...8.30

Del.quantity cm3/ : 1.2...1.8

100H.: (0.9...2.0)

Dispersion cm3/ : 0.4

100H.: (0.7)

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1150

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 110.0...112.0

1000H.: (107.0...115.0)

Dispersion cm3/ : 4.00

1000H.: (8.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 56...64

#### Testing:

1st c-rod trav.mm : 10.00

Speed 1/min : 1140...1150

2nd c-rod trav.mm : 4.00

Speed 1/min : 1175...1205

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 22...30

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 9.50

Speed 1/min : 300

C-rod trav.mm : 8.00...8.20

#### CONSTANT REGULATION

Speed 1/min : 320...435

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 91.0...93.0

1000H.: (88.0...96.0)

Dispersion cm3/ : -

1000H.: (9.00)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.00

Speed 1/min : 1140...1150

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,4 A  
 Edition : 14.08.87  
 Superceeded : 10.83  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 046 148  
 Injection pump  
 Pump designation : PES6P100A820LS351  
 EP type number : 0 412 006 028  
 Governor  
 Governor design. : RQ300/1100PA327R  
 Governor no. : 0 421 801 062

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM 407

1st version kW : 176.5  
 Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 13.20...13.30

Del.quantity cm3/ : 12.2...12.4

100H.: (12.0...12.6)

Dispersion cm3/ : 0.3

100H.: (0.6)

2nd speed 1/min: 300

Contr.-rod trav. m: 7.50...7.70

Del.quantity cm3/ : 0.6...1.2

100H.: (0.3...1.4)

Dispersion cm3/ : 0.3

100H.: (0.5)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 500

Contr.-rod travelmm: 14.30...15.10

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 122.0...124.0

1000H.: (120.0...126.0)

Dispersion cm3/ : 3.00

1000H.: (6.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 41...49

Setting point:

Speed 1/min : 500

Contr.-rod trav.mm: 14.7

Testing:

1st c-rod trav.mm : 12.20

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1200...1230  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.50

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 10...18  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 7.6

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 9.60  
Speed 1/min : 300  
C-rod trav.mm : 7.60  
C-rod trav.mm : 2.00  
Speed 1/min : 370...410

#### SETTING CONTROL-ROD STOP

Speed 1/min : 500

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 12.20  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 135.0...155.0  
1000H.: (131.0...159.0)

#### Remarks:

APPLICATION  
Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RVI 8,8 B1  
 Edition : 18.8.87  
 Superceeded : 9.86  
 Calibrating oil : ISO-4.13  
 Combination no. : 0 402 046 226  
 Injection pump  
 Pump designation : PES6P120A32ORS417  
 EP type number : 0 412 026 036  
 Governor  
 Governor design. : RQV300...1150PAS27K  
 Governor no. : 0 421 815 164

Customer-spec. information  
 Customer : RVI

Engine : MIDS 062030

1st version kW : 158.1  
 Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 10.00...11.00

## BASIC SETTING

1st speed 1/mi: 1150  
 -----  
 Contr.-rod trav.mm: 8.40...8.50  
 -----  
 Del.quantity cm3/ : 14.3...14.5  
 -----  
 100H.: (14.0...14.8)  
 -----  
 Dispersion cm3/ : 0.5  
 -----  
 100H.: (0.9)  
 -----

2nd speed 1/min: 600  
 Contr.-rod trav. m: 3.00...3.20  
 Del.quantity cm3/ : 1.8...2.4  
 100H.: (1.5...2.7)  
 Dispersion cm3/ : 0.8  
 100H.: (1.2)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300  
 Sleeve travel mm: 1.70...2.10  
 2nd speed 1/min: 900  
 Sleeve travel mm: 5.80...6.20  
 3rd speed 1/min: 1150  
 Sleeve travel mm: 8.00...8.20

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 1190  
 Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1150  
 Del.quantity cm3/ : 143.0...145.0  
 1000H.: (140.0...148.0)  
 Dispersion cm3/ : 5.00  
 1000H.: (9.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 113...121

### Testing:

1st c-rod trav.mm : 7.40

Speed 1/min : 1235...1245

2nd c-rod trav.mm : 4.00

Speed 1/min : 1290...1320

4th speed 1/min : 1450

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 62...70

Speed 1/min : 300

C-rod trav.mm : 3.20...3.40

Speed 1/min : 100

C-rod trav.mm max : 6.20

## CONSTANT REGULATION

Speed 1/min : 320...440

## TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1150

C-rod trav.mm : 8.40

2nd speed 1/min : 750

C-rod trav.mm : 7.40...7.50

3rd speed 1/min : 500

C-rod trav.mm : 6.80...7.10

4th speed 1/min : 350

C-rod trav.mm : 6.60...7.00

## SWITCH-OVER POINT

Speed 1/min : 220 (240)

## FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 750

Del.quantity cm3/ : 120.0...126.0

1000H.: (117.0...129.0)

Speed 1/min : 500

Del.quantity cm3/ : 67.0...73.0

1000H.: (64.0...76.0)

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 7.40

Speed 1/min : 1235...1245

## STARTING FUEL DELIVERY

Speed 1/min : 100

K07

Del.quantity cm3/ : 125.0...145.0  
1000H.: (121.0...149.0)

## LOW IDLE

Speed 1/min : 300

Contr.-rod trav.mm: 3.20...3.40

Del.quantity cm3/ : 18.0...24.0

1000H.: (15.0...27.0)

Dispersion cm3/ : 8.00

1000H.: (12.00)

### Remarks:

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RVI 8,8 B2  
 Edition : 18.8.87  
 Superseded : 5.84  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 046 247  
 Injection pump  
 Pump designation : PES6P120A32ORS417  
 EP type number : 0 412 026 036  
 Governor  
 Governor design. : RQV300...1150PA  
 S27-1K  
 Governor no. : 0 421 815 165  
 Customer-spec. information  
 Customer : RVI

Engine : MIDR 062030

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke min : 2.80...2.90  
 : (2.75...2.95)

Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 10.00...11.00

## BASIC SETTING

1st speed 1/mi: 1150  
 -----  
 Contr.-rod trav.mm: 8.50...8.60  
 -----  
 Del.quantity cm3/ : 14.4...14.6  
 -----  
 100H.: (14.1...14.9)  
 -----  
 Dispersion cm3/ : 0.5  
 -----  
 100H.: (0.9)  
 -----  
 2nd speed 1/min: 600.0  
 Contr.-rod trav. m: 2.70...2.90  
 Del.quantity cm3/ : 1.8...2.4  
 100H.: (1.5...2.7)  
 Dispersion cm3/ : 0.8  
 100H.: (1.2)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300  
 Sleeve travel mm: 1.70...2.10  
 2nd speed 1/min: 900  
 Sleeve travel mm: 5.80...6.20  
 3rd speed 1/min: 1150  
 Sleeve travel mm: 8.00...8.20

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 1190  
 Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 1150  
 Del.quantity cm3/ : 144.0...146.0  
 1000H.: (141.0...149.0)  
 Dispersion cm3/ : 5.00  
 1000H.: (9.00)

## HIGHEST RATED SPEED



1st version  
Control-lever  
position degrees: 56...64

Testing:  
1st c-rod trav.mm : 7.50  
Speed 1/min : 1205...1215  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1260...1290  
4th speed 1/min : 1450  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I  
Control-lever  
position degrees: 6...14

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 6.30  
Speed 1/min : 300  
C-rod trav.mm : 3.30...3.50

CONSTANT REGULATION  
Speed 1/min : 320...440

TORQUE CONTROL  
Torque-control curve - 1st version  
1st speed 1/min : 1150  
C-rod trav.mm : 8.50...8.60  
2nd speed 1/min : 750  
C-rod trav.mm : 7.60...7.70  
3rd speed 1/min : 500  
C-rod trav.mm : 7.00...7.20  
4th speed 1/min : 350  
C-rod trav.mm : 7.00...7.20

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS  
Speed 1/min : 750  
Del.quantity cm3/ : 122.0...128.0  
1000H.: (119.0...131.0)  
Speed 1/min : 500  
Del.quantity cm3/ : 69.0...75.0  
1000H.: (66.0...78.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 7.50  
Speed 1/min : 1205...1215

#### STARTING FUEL DELIVERY

Speed 1/min : 100

K09

Del.quantity cm3/ : 140.0...160.0  
1000H.: (136.0...164.0)

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 3.30...3.50  
Del.quantity cm3/ : 18.0...24.0  
1000H.: (15.0...27.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:  
Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,4 L10  
 Edition : 09.03.87  
 Superceeded : 11.85  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 046 299  
 Injection pump  
 Pump designation : PES6P110A820LS442  
 EP type number : 0 412 016 060  
 Governor  
 Governor design. : RQ250/950PA483-3  
 Governor no. : 0 421 801 363

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM407

1st version kW : 147.0  
 Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 950

Contr.-rod trav.mm: 11.40...11.50

Del.quantity cm3/ : 11.0...11.2  
 100H.: (10.7...11.5)

Dispersion cm3/ : 0.4  
 100H.: (0.8)

2nd speed 1/min: 250  
 Contr.-rod trav. m: 8.40...8.60  
 Del.quantity cm3/ : 1.4...2.0  
 100H.: (1.1...2.2)  
 Dispersion cm3/ : 0.4  
 100H.: (0.7)

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 600  
 Contr.-rod travelmm: 13.00...14.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 950  
 Del.quantity cm3/ : 110.0...112.0  
 1000H.: (107.0...115.0)  
 Dispersion cm3/ : 4.00  
 1000H.: (8.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 36...44

Setting point:  
 Speed 1/min : 600  
 Contr.-rod trav.mm: 13.5

Testing:  
 1st c-rod trav.mm : 10.40  
 Speed 1/min : 995...1010

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1040...1070  
4th speed 1/min : 1150  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 250  
Contr.-rod trav.mm: 8.1

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 9.70  
Speed 1/min : 250  
C-rod trav.mm : 8.10  
C-rod trav.mm : 2.00  
Speed 1/min : 330...370

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 97.0...101.0  
1000H.: (94.0...104.0)  
Dispersion cm3/ : 6.00  
1000H.: (9.00)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 10.40  
Speed 1/min : 995...1010

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 140.0...160.0  
1000H.: (136.0...164.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet	: MB 11,4 L3
Edition	: 09.03.87
Superceeded	: 11.85
Calibrating oil	: ISO-4113
Combination no.	: 0 402 046 301
Injection pump	
Pump designation	: PES6P110A820LS442
EP type number	: 0 412 016 060
Governor	
Governor design.	: RQV300...1100PAS94-3
Governer no.	: 0 421 813 324

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : 407 STEHEND

1st version kW : 162.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

START OF DELIVERY  
Test pressure, bar: 25...27

```

Prestroke mm      : 3.20...3.30
                   : (3.15...3.35)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence      : 6- 2- 4- 1- 5- 3

```

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + -<sup>o</sup>: 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

```
1st speed      1/mi: 1100
-----
Contr.-rod trav.mm: 10.90...11.00
```

Del.quantity cm3/ : 11.3...11.5  
100H.: (11.0...11.8)

Dispersion    cm<sup>3</sup>/ : 0.4  
 100H.: (0.8)

```

2nd speed      1/min: 300
Contr.-rod trav. m: 8.00...8.20
Del.quantity   cm3/ : 1.4...2.0
                100H.: (1.1...2.2)
Dispersion     cm3/ : 0.4
                100H.: (0.7)

```

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 17/min: 1100  
Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

```
1st version
Speed      1/min: 1100
Del.quantity cm3/ : 113.0...115.0
            1000H.: (110.0...118.0)
Dispersion cm3/ : 4.00
            1000H.: (8.00)
```

HIGHEST RATED SPEED

```
1st version
Control-lever
position degrees: 56...64
```

```

Testing:
1st c-rod trav.mm : 9.90
  Speed    1/min : 1140...1150
2nd c-rod trav.mm : 4.00
  Speed    1/min : 1175...1205
4th speed  1/min : 1300
  C-rod trav.mm : 0.00...1.00

```

LOWEST RATED SPEED I

Control-lever

position degrees: 28...36

Testing:

Speed 1/min : 100

C-rod trav.mm min : 9.70

Speed 1/min : 300

C-rod trav.mm : 8.00...8.20

CONSTANT REGULATION

Speed 1/min : 320...450

SWITCH-OVER POINT

Speed 1/min : 220 (240)

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 90.0...94.0

1000H.: (87.0...97.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.90

Speed 1/min : 1140...1150

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RVI 9,8 A5  
Edition : 09.03.87  
Superceeded : 7.84  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 303  
Injection pump  
Pump designation : PES6P120A32ORS419  
EP type number : 0 412 026 037  
Governor  
Governor design. : RQV275...1100PA495-7  
Governor no. : 0 421 813 449

Customer-spec. information  
Customer : RVI

Engine : MIDR 062045

1st version kW : 157.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 10.00...11.00

## BASIC SETTING

1st speed 1/mi: 1100  
-----  
Contr.-rod trav.mm: 7.80...7.90  
-----  
Del.quantity cm3/ : 13.2...13.4  
-----  
100H.: (12.9...13.7)  
-----  
Dispersion cm3/ : 0.5  
-----  
100H.: (0.9)  
-----  
2nd speed 1/min: 275  
Contr.-rod trav. m: 4.60...4.80  
Del.quantity cm3/ : 1.7...2.3  
100H.: (1.4...2.6)  
Dispersion cm3/ : 0.8  
100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 275  
Sleeve travel mm: 1.30...1.50  
2nd speed 1/min: 450  
Sleeve travel mm: 3.30...3.70  
3rd speed 1/min: 850  
Sleeve travel mm: 6.00...6.20  
4th speed 1/min: 1100  
Sleeve travel mm: 7.70...7.90

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1175  
Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1100  
Charge press. hPa : 700

Del.quantity cm3/ : 132.0...134.0  
1000H.: (129.0...137.0)  
Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 60...68

#### Testing:

1st c-rod trav.mm : 6.80  
Speed 1/min : 1185...1195  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1220...1250  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 5...13  
Speed 1/min : 275  
C-rod trav.mm : 3.40...3.60  
Speed 1/min : 200  
C-rod trav.mm max : 5.50

#### CONSTANT REGULATION

Speed 1/min : 285...405

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 7.80...7.90

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 7.30...7.40  
2nd pressure hPa : 145  
C-rod trav.mm : 7.50...7.60

#### SWITCH-OVER POINT

Speed 1/min : 195 (215)

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 700  
Speed 1/min : 700  
Del.quantity cm3/ : 120.0...126.0  
1000H.: (117.0...129.0)  
Charge press. hPa : -  
Speed 1/min : 500

Del.quantity cm3/ : 88.0...90.0  
1000H.: (85.0...93.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 6.80  
Speed 1/min : 1185...1195

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 150.0...170.0  
1000H.: (146.0...174.0)

#### LOW IDLE

Speed 1/min : 275  
Contr.-rod trav.mm: 3.40...3.60

Start-of-delivery mark 11.5° cam angle  
after start of delivery cyl. 1

#### APPLICATION

Special-purpose vehicle

Note inst. in remarks column

## TEST BENCH REQUIREMENTS

START OF DELIVERY  
Test pressure, bar: 25...27

```

1st version
Speed      1/min: 900
Del.quantity cm3/ : 189.0...191.0
              1000H.: (186.0...194.0)
Dispersion cm3/ : 5.00
              1000H.: (9.00)

```



# HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 48...56

## Testing:

1st c-rod trav.mm : 9.70

Speed 1/min : 990...1000

2nd c-rod trav.mm : 4.00

Speed 1/min : 1050...1080

4th speed 1/min : 1200

C-rod trav.mm : 0.00...1.00

# LOWEST RATED SPEED I

Control-lever

position degrees: 15...23

## Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.30

Speed 1/min : 250

C-rod trav.mm : 5.70...5.90

# CONSTANT REGULATION

Speed 1/min : 250...540

# SWITCH-OVER POINT

Speed 1/min : 170 (190)

# ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.70

Speed 1/min : 990...1000

# STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 140.0...170.0

1000H.: (-)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,4 I3  
 Edition : 09.03.87  
 Superceeded : 7.85  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 046 727  
 Injection pump  
 Pump designation : PES6P120A820  
 LS3077-10  
 EP type number : 0 412 026 714  
 Governor  
 Governor design. : RQ300/1100PA603  
 Governor no. : 0 421 801 153

Customer-spec. information  
 Customer : DAIMLER-BENZ

Engine : OM407 HA

1st version kW : 206.0  
 Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11.70...11.80

Del.quantity cm3/ : 18.4...18.6

100H.: (18.1...18.9)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300

Contr.-rod trav. m: 5.00...5.20

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.3)

Dispersion cm3/ : 0.8

100H.: (1.2)

## SLEEVE POSITION

Control-lever position

Degree: -2

Speed 1/min: 650

Contr.-rod travelmm: 19.10...20.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Charge press. hPa : 750

Del.quantity cm3/ : 184.0...186.0

1000H.: (181.0...189.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

## HIGHEST RATED SPEED

Setting point:

Speed 1/min : 650

Contr.-rod trav.mm: 19.9

Testing:

1st c-rod trav.mm : 10.70  
Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1190...1220  
4th speed 1/min : 1260  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 5.1

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.50  
Speed 1/min : 300  
C-rod trav.mm : 5.10  
C-rod trav.mm : 2.00  
Speed 1/min : 355...395

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1100  
C-rod trav.mm : 11.70...11.80  
2nd speed 1/min : 600  
C-rod trav.mm : 12.30...12.40  
3rd speed 1/min : 950  
C-rod trav.mm : 12.00...12.20

compensator (LDA,ADA,ALDA)

#### 1st version

##### Setting

Speed 1/min : 500  
Pressure hPa : 750  
Contr.-rod trav.mm: 12.30...12.40

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 10.30...10.40  
2nd pressure hPa : 530  
C-rod trav.mm : 11.70...11.80  
3rd pressure hPa : 420  
C-rod trav.mm : 10.80...11.00

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Charge press. hPa : 750  
Speed 1/min : 600  
Del.quantity cm3/ : 187.0...193.0  
1000H.: (184.0...196.0)  
Dispersion cm3/ : -  
1000H.: 12.00  
Speed 1/min : 500

Del.quantity cm3/ : 145.0...147.0  
1000H.: (142.0...150.0)  
Dispersion cm3/ : -  
1000H.: 12.00

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 10.70  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 175.0...195.0  
1000H.: (171.0...199.0)

#### Remarks:

APPLICATION

Omnibus

**BOSCH INJ. PUMP TEST SPECIFICATIONS**

Note inst. in remarks column

Test sheet : MB 11,7 A1  
Edition : 09.03.87  
Superceeded : 5.85  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 046 750  
  
Injection pump  
Pump designation : PES6P110A82OLS3131  
EP type number : 0 412 016 715  
Governor  
Governor design. : RQ300/1100PA722  
Governor no. : 0 421 801 264

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM427H

1st version kW : 150.0  
Speed 1/min: 2200

**TEST BENCH REQUIREMENTS**

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...110

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
: (4.25...4.45)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

**BASIC SETTING**

1st speed 1/mi: 1100

Contr.-rod trav.mm: 9.40...9.50

Del.quantity cm3/ : 11.0...11.2

100H.: (10.7...11.4)

Dispersion cm3/ : 0.4

100H.: (0.8)

2nd speed 1/min: 300

Contr.-rod trav. m: 7.20...7.40

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm3/ : 0.4

100H.: (0.8)

**SLEEVE POSITION**

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 13.00...14.00

**FULL-LOAD DELIV. AT FULL-LOAD STOP**

1st version

Speed 1/min: 1100

Charge press. hPa : -

Del.quantity cm3/ : 110.0...112.0

1000H.: (107.5...114.5)

Dispersion cm3/ : 4.00

1000H.: (8.00)

**HIGHEST RATED SPEED**

1st version

Control-lever

position degrees: 97...103

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 13.5

Testing:

1st c-rod trav.mm : 8.40

Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1195...1225  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.50

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 75...81  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 7.3

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.80  
Speed 1/min : 300  
C-rod trav.mm : 7.30  
C-rod trav.mm : 2.00  
Speed 1/min : 380...420

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 9.40...9.50  
2nd speed 1/min : 500  
C-rod trav.mm : 10.20...10.40  
3rd speed 1/min : 850  
C-rod trav.mm : 9.80...10.10  
4th speed 1/min : 950  
C-rod trav.mm : 9.60...9.80

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : -  
Speed 1/min : 500  
Del. quantity cm3/ : 96.0...100.0  
1000H.: (93.0...103.0)  
Dispersion cm3/ : 6.00  
1000H.: (9.00)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 8.40  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del. quantity cm3/ : 130.0...150.0  
1000H.: (126.0...154.0)

Remarks:

K21

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,7 A3  
Edition : 09.03.87  
Superceeded : 7.85  
Calibrating oil : ISO-4113

Combination no. : 0 402 046 751

Injection pump  
Pump designation : PES6P110A820LS3131  
EP type number : 0 412 016 715  
Governor  
Governor design. : RQ300/1100PA723-  
Governor no. : 0 421 801 265

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM427H

1st version kW : 177.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...110

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
                  : (4.25...4.45)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - <sup>o</sup> : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11.10...11.20

Del.quantity cm3/ : 14.0...14.2

100H.: (13.7...14.5)

Dispersion cm3/ : 0.4

100H.: (0.8)

2nd speed 1/min: 300

Contr.-rod trav. m: 7.10...7.30

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.3)

Dispersion cm3/ : 0.4

100H.: (0.7)

#### SLEEVE POSITION

Control-lever position

Degree: -2

Speed 1/min: 550

Contr.-rod travelmm: 14.70...16.40

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 140.0...142.0

1000H.: (137.0...145.0)

Dispersion cm3/ : 4.00

1000H.: (8.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 94...100

Setting point:

Speed 1/min : 550

Contr.-rod trav.mm: 15.5

Testing:

1st c-rod trav.mm : 10.20

Speed 1/min : 1145...1160

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1180...1210  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.50

#### LOWEST RATED SPEED I

Control-lever

position degrees: 73...79

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 7.2

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.80

Speed 1/min : 300

C-rod trav.mm : 7.30

C-rod trav.mm : 2.00

Speed 1/min : 360...400

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 117.0...121.0

1000H.: (114.0...124.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.20

Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11-4 I9  
Edition : 30.03.87  
Superceeded : 4.85  
Calibrating oil : ISO-4113

Combination no. : 0 402 046 752

Injection pump  
Pump designation : PES6P120A820  
LS3077-10  
EP type number : 0 412 026 714  
Governor  
Governor design. : RQ250/950PA585-3  
Governor no. : 0 421 801 266

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM407A

1st version kW : 202.0  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

## START OF DELIVERY

Test pressure, bar: 25...27

```

Prestroke mm      : 4.00...4.10
                  : (3.95...4.15)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence      : 6- 2- 4- 1- 5- 3

```

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - <sup>o</sup>: 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed      1/mi: 950

Contr.-rod trav.mm: 11.60...11.70

Del.quantity cm3/ : 18.3...18.5  
100H.: (18.0...18.8)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.9)

2nd speed 1/min: 250  
Contr.-rod trav. m: 5.30...5.50  
Del.quantity cm3/ : 1.4...2.0  
100H.: (1.1...2.3)  
Dispersion cm3/ : 0.8  
100H.: (1.2)

## SLEEVE POSITION

```
Control-lever position
Degree: -2
Speed      17/min: 650
Cont.-rod travelmm: 19.20...20.80
```

FULL-LOAD DELIV. AT FULL-LOAD STOP

```
1st version
Speed      1/min: 950
Charge press. hPa : 700
Del. quantity cm3/ : 183.0...185.0
            1000H.: (180.0...188.0)
Dispersion cm3/ : 5.00
            1000H.: (9.00)
```

HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 28...36

Setting point:  
Speed 1/min : 650



Contr.-rod trav.mm: 20.0

Testing:

1st c-rod trav.mm : 10.60  
Speed 1/min : 995...1010  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1030...1060  
4th speed 1/min : 1150  
C-rod trav.mm : 0.00...1.50

LOWEST RATED SPEED I

Control-lever  
position degrees: 7...15  
Setting point w/out aux. spring  
Speed 1/min : 250  
Contr.-rod trav.mm: 5.4

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.10  
Speed 1/min : 250  
C-rod trav.mm : 5.40  
C-rod trav.mm : 2.00  
Speed 1/min : 270...330

compensator (LDA,ADA,ALDA)

1st version

Setting  
Speed 1/min : 500  
Pressure hPa : -  
Contr.-rod trav.mm: -

Measurement

Speed 1/min : 500  
1st pressure hPa : 270  
C-rod trav.mm : 0.40...0.60

SWITCH-OVER POINT

Speed 1/min : 170 (190)

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700  
Speed 1/min : 600  
Del.quantity cm3/ : 177.0...183.0  
1000H.: (174.0...186.0)  
Dispersion cm3/ : 8.0  
1000H.: (12.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 144.0...146.0  
1000H.: (141.0...149.0)  
Dispersion cm3/ : 8.00  
1000H.: (-)

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 10.60  
Speed 1/min : 995...1010

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 160.0...180.0  
1000H.: (156.0...184.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RVI 12,0 F1  
Edition : 31.07.87  
Superceeded : 4.85  
Calibrating oil : ISO-4113

Combination no. : 0 402 046 758

Injection pump  
Pump designation : PES6P120A32ORS3139  
EP type number : 0 412 026 718  
Governor  
Governor design. : RQV275...950PA728-1  
Governor no. : 0 421 813 465

Customer-spec. information  
Customer : RVI

Engine : MIDR 063540

1st version kW : 243.0  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

#### START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 10.00...11.00

#### BASIC SETTING

1st speed 1/mi: 950

Contr.-rod trav.mm: 12.50...12.60

Del.quantity cm3/ : 23.0...23.2

100H.: (22.7...23.5)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 5.40...5.60

Del.quantity cm3/ : 2.0...2.6

100H.: (1.7...2.9)

Dispersion cm3/ : 0.8

100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.00...1.20

2nd speed 1/min: 450

Sleeve travel mm: 3.30...3.80

3rd speed 1/min: 800

Sleeve travel mm: 5.80...6.00

4th speed 1/min: 950

Sleeve travel mm: 6.80...6.90

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1140

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 950

Charge press. hPa : 1000

Del.quantity cm3/ : 230.0...232.0  
1000H.: (227.0...235.0)

Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 59...67

Testing:

1st c-rod trav.mm : 11.50

Speed 1/min : 1020...1030

2nd c-rod trav.mm : 4.00

Speed 1/min : 1155...1185

4th speed 1/min : 1250

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 8...16

Speed 1/min : 275

C-rod trav.mm : 5.40...5.60

Speed 1/min : 200

C-rod trav.mm max : 7.00

#### CONSTANT REGULATION

Speed 1/min : 300...400

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 1000

Contr.-rod trav.mm: 12.50...12.60

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 9.40...9.50

2nd pressure hPa : 500

C-rod trav.mm : 11.70...11.80

3rd pressure hPa : 200

C-rod trav.mm : 9.80...10.40

#### SWITCH-OVER POINT

Speed 1/min : 195 (215)

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 1000

Speed 1/min : 600

Del.quantity cm3/ : 235.0...241.0

1000H.: (232.0...244.0)

Charge press. hPa : -  
Speed 1/min : 950  
Del.quantity cm3/ : 149.0...151.0  
1000H.: (146.0...154.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 11.50  
Speed 1/min : 1020...1030

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 140.0...160.0  
1000H.: (136.0...164.0)

#### LOW IDLE

Speed 1/min : 275  
Contr.-rod trav.mm: 5.40...5.60  
Del.quantity cm3/ : 20.0...26.0  
1000H.: (17.0...29.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 9,6 N  
Edition : 18.8.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 759  
Injection pump  
Pump designation : PES6P110A72ORS3104  
EP type number : 0 412 016 712  
Governor  
Governor design. : RQ900PA738  
Governor no. : 0 421 801 278

Customer-spec. information  
Customer : KHD

Engine : BF6L413FR/C

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2,80...2,90  
: (2,75...2,95)

Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 1-5-3-6-2-4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - ° : 0,50 (0,75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 850

Contr.-rod trav.mm: 12,60...12,70

Del.quantity cm3/ : 14,7...14,9

100H.: (14,4...15,2)

Dispersion cm3/ : 0,40

100H.: (0,75)

2nd speed 1/min: 300

Contr.-rod trav. m: 7,10...7,30

Del.quantity cm3/ : 1,3...1,9

100H.: (1,0...2,1)

Dispersion cm3/ : 0,45

100H.: (0,75)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 850

Charge press. hPa : -

Del.quantity cm3/ : 147,0...149,0

1000H.: (144,0...152,0)

Dispersion cm3/ : 4,0

1000H.: (7,5)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 37...45

Testing:

1st c-rod trav.mm : 11,60

Speed 1/min: 900...905

2nd c-rod trav.mm : 5,50

Speed 1/min: 936...945

4th speed 1/min: 1050

C-rod trav.mm : 0,00...1,00

## SWITCH-OVER POINT

Speed 1/min : 750

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11,60

Speed 1/min : 900...905

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 170,0...200,0  
1000H.: (-)

Remarks:  
APPLICATION  
Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11.7 A6  
Edition : 13.05.87  
Superceeded : 10.86  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 767  
Injection pump  
Pump designation : PES6P110A820LS3131  
EP type number : 0 412 016 715  
Governor  
Governor design. : RQ300/1100PA786  
Governor no. : 0 421 801 336

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM447

1st version kW : 150.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
                  : (4.25...4.45)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 9.60...9.70

Del.quantity cm3/ : 11.4...11.6

100H.: (11.1...11.8)

Dispersion cm3/ : 0.4

100H.: (0.8)

2nd speed 1/min: 300

Contr.-rod trav. m: 7.20...7.40

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.2)

Dispersion cm3/ : 0.4

100H.: (0.8)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 13.00...14.00

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Charge press. hPa : -

Del.quantity cm3/ : 114.0...116.0

1000H.: (111.5...118.5)

Dispersion cm3/ : 4.00

1000H.: (8.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 32...40

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 13.5

Testing:

1st c-rod trav.mm : 8.60

Speed 1/min : 1140...1155  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1200...1230  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.50

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 11...19  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 7.3

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 8.80  
Speed 1/min : 300  
C-rod trav.mm : 7.30  
C-rod trav.mm : 2.00  
Speed 1/min : 360...400

#### TORQUE CONTROL

Dimension a mm : 0.50  
Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 9.60...9.70  
2nd speed 1/min : 600  
C-rod trav.mm : 10.30...10.60

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : -  
Speed 1/min : 600  
Del.quantity cm3/ : 98.0...101.0  
1000H.: (95.0...104.0)  
Dispersion cm3/ : 6.00  
1000H.: (9.00)

#### SETTING CONTROL-ROD STOP

Speed 1/min : 500

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 8.60  
Speed 1/min : 1140...1155

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 130.0...150.0  
1000H.: (126.0...154.0)

Remarks:

L05



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9 D  
Edition : 09.03.87  
Superceeded : 4.86  
Calibrating oil : ISO-4113

Combination no. : 0 402 046 769

Injection pump  
Pump designation : PES6P120A720LS3167  
EP type number : 0 412 026 720  
Governor  
Governor design. : RQV300...1100PA667-2  
Governor nc. : 0 421 813 524

Customer-spec. information  
Customer : MAN

Engine : D2866LE

1st version kW : 300.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x3.00x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90  
                  : (3.75...3.95)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 12.60...12.70

Del.quantity cm<sup>3</sup>/ : 23.4...23.6

100H.: (23.1...23.9)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm<sup>3</sup>/ : 1.7...2.3

100H.: (1.4...2.6)

Dispersion cm<sup>3</sup>/ : 0.8

100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.20...1.40

2nd speed 1/min: 500

Sleeve travel mm: 3.30...3.50

3rd speed 1/min: 900

Sleeve travel mm: 5.90...6.20

4th speed 1/min: 1100

Sleeve travel mm: 7.60...7.80

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1175

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm<sup>3</sup>/ : 234.0...236.0

1000H.: (231.0...239.0)

Dispersion cm<sup>3</sup>/ : 5.00

1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 49...57

Testing:

1st c-rod trav.mm : 11.60

Speed 1/min : 1140...1150

2nd c-rod trav.mm : 4.00

Speed 1/min : 1245...1275

4th speed 1/min : 1400

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 13...21

Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.50

Speed 1/min : 300

C-rod trav.mm : 5.90...6.10

#### CONSTANT REGULATION

Speed 1/min : 330...445

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.60

Speed 1/min : 1140...1150

#### MIDDLE RATED SPEED

Contr.-rod trav.mm: 4.00

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm<sup>3</sup>/ : 200.0...220.0

1000H.: (196.0...224.0)

#### LOW IDLE

Speed 1/min : 300

Contr.-rod trav.mm: 5.90...6.10

Del.quantity cm<sup>3</sup>/ : 17.0...23.0

1000H.: (14.0...26.0)

Dispersion cm<sup>3</sup>/ : 8.00

1000H.: (12.00)

Remarks:

: MAN-NR. 2-7656

APPLICATION  
Ship

L08

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ROL 12,2 H1  
Edition : 09.03.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 772  
Injection pump  
Pump designation : PES6P120A32ORS3170  
EP type number : 0 412 026 722  
Governor  
Governor design. : RQV250...950PA794-1  
Governor no. : 0 421 813 579

Customer-spec. information  
Customer : ROLLS ROYCE

Engine : EAGLE LE

1st version kW : 204.0  
Speed 1/min: 1900

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 4- 2- 6- 3- 5

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 900

Contr.-rod trav.mm: 12.90...13.00

Del.quantity cm3/ : 21.5...21.7  
100H.: (21.2...22.0)

Dispersion cm3/ : 0.5  
100H.: (0.9)

2nd speed 1/min: 250  
Contr.-rod trav. m: 5.50...5.70  
Del.quantity cm3/ : 1.7...2.3  
100H.: (1.4...2.6)  
Dispersion cm3/ : 0.8  
100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 250  
Sleeve travel mm: 1.50...1.70  
2nd speed 1/min: 350  
Sleeve travel mm: 2.20...2.70  
3rd speed 1/min: 500  
Sleeve travel mm: 3.00...3.40  
4th speed 1/min: 1000  
Sleeve travel mm: 8.00...8.20  
5th speed 1/min: 1060  
Sleeve travel mm: 8.90...9.20

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1000  
Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 900  
Charge press. hPa : 700  
Del.quantity cm3/ : 215.0...217.0  
1000H.: (212.0...220.0)

Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 50...58

#### Testing:

1st c-rod trav.mm : 11.90

Speed 1/min : 990...1000

2nd c-rod trav.mm : 4.00

Speed 1/min : 1055...1085

4th speed 1/min : 1200

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 15...23

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.00

Speed 1/min : 250

C-rod trav.mm : 5.50...5.70

#### CONSTANT REGULATION

Speed 1/min : 250...470

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 12.90...13.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 11.70...11.90

2nd pressure hPa : 330

C-rod trav.mm : 12.00...12.10

3rd pressure hPa : 510

C-rod trav.mm : 12.60...12.80

#### SWITCH-OVER POINT

Speed 1/min : 170 (190)

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700

Speed 1/min : 500

Del.quantity cm3/ : 200.0...206.0

1000H.: (197.0...209.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 170.0...174.0

1000H.: (167.0...177.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.90

Speed 1/min : 990...1000

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 140.0...170.0

1000H.: (136.0...174.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,7 A 9  
Edition : 02.12.86  
Superceeded : 12.85  
Calibrating oil : ISO-4113

Combination no. : 0 402 046 773

Injection pump  
Pump designation : PES6P110A820LS3131  
EP type number : 0 412 016 715  
Governor  
Governor design. : RQ300/1100PA800-  
Governor no. : 0 421 801 347

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM427H

1st version kW : 177.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40  
                  : (4.25...4.45)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 6

#### BASIC SETTING

1st speed 1/mi: 1100

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 13.9...14.1

100H.: (13.6...14.3)

Dispersion cm3/ : 0.4

100H.: (0.8)

2nd speed 1/min: 300

Contr.-rod trav. m: 7.20...7.40

Del.quantity cm3/ : 1.4...2.0

100H.: (1.1...2.3)

Dispersion cm3/ : 0.4

100H.: (0.8)

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 13.00...14.00

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Del.quantity cm3/ : 139.0...141.0

1000H.: (136.5...143.5)

Dispersion cm3/ : 4.00

1000H.: (8.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 99...105

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 13.5

Testing:

1st c-rod trav.mm : 10.00

Speed 1/min : 1140...1155

2nd c-rod trav.mm : 4.00  
Speed 1/min : 1185...1215  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.50

#### LOWEST RATED SPEED I

Control-lever

position degrees: 76...82

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 7.3

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.80

Speed 1/min : 300

C-rod trav.mm : 7.30

C-rod trav.mm : 2.00

Speed 1/min : 380...420

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 116.0...119.0

1000H.: (113.0...122.0)

Dispersion cm3/ : -

1000H.: (9.00)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 10.00

Speed 1/min : 1140...1155

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 9,6 T  
Edition : 20.8.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 774  
Injection pump  
Pump designation : PES6P110A72ORS3104  
EP type number : 0 412 016 712  
Governor  
Governor design. : RQV300...1150PA801  
Governor no. : 0 421 813 537

Customer-spec. information  
Customer : KHD

Engine : BF6L513R

1st version kW : 177.0  
Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Prestroke mm : 2,80...2,90  
: (2,75...2,95)  
Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 1-5-3-6-2-4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0,50 (0,75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 13,40...13,50

Del.quantity cm3/ : 15,1...15,3

100H.: (14,8...15,6)

Dispersion cm3/ : 0,40

100H.: (0,75)

2nd speed 1/min: 300

Contr.-rod trav. m: 7,90...8,10

Del.quantity cm3/ : 1,6...2,2

100H.: (1,3...2,4)

Dispersion cm3/ : 0,40

100H.: (0,75)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1,30...1,40

2nd speed 1/min: 390

Sleeve travel mm: 2,40...2,70

3rd speed 1/min: 460

Sleeve travel mm: 2,80...3,20

4th speed 1/min: 1190

Sleeve travel mm: 8,40...8,50

5th speed 1/min: 1290

Sleeve travel mm: 9,40...9,70

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1190

Contr.-rod travelmm: 15,20...17,80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Charge press. hPa : 900

Del.quantity cm3/ : 151,0...153,0

1000H.: (148,0...156,0)

Dispersion cm3/ : 4,0

1000H.: (7,5)



### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 51...59

#### Testing:

1st c-rod trav.mm : 12,40

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4,00

Speed 1/min : 1310...1340

4th speed 1/min : 1400

C-rod trav.mm : 0,00...1,00

### LOWEST RATED SPEED I

Control-lever

position degrees: 16...24

#### Testing:

Speed 1/min : 100

C-rod trav.mm min : 9,40

Speed 1/min : 300

C-rod trav.mm : 7,90...8,10

### CONSTANT REGULATION

Speed 1/min : 320...480

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 450

Pressure hPa : 900

Contr.-rod trav.mm: 13,60...13,70

#### Measurement

Speed 1/min : 450

1st pressure hPa : -

C-rod trav.mm : 12,50...12,70

2nd pressure hPa : 420

C-rod trav.mm : 13,20...13,30

3rd pressure hPa : 360

C-rod trav.mm : 12,70...12,90

### SWITCH-OVER POINT

Speed 1/min : 250 (270)

### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 450

Del.quantity cm3/ : 123,0...125,0

1000H.: (120,0...128,0)

### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 12,40

Speed 1/min : 1190...1200

### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 170,0...200,0

1000H.: (166,0...204,0)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MAN 11,9 H  
Edition : 21.8.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 777  
Injection pump  
Pump designation : PES6P120A72OLS3167  
EP type number : 0 412 026 720  
Governor  
Governor design. : RQ750PA661-4  
Governor no. : 0 421 801 361

Customer-spec. information  
Customer : MAN

Engine : D2866TE

1st version kW : 190.0  
Speed 1/min: 1500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8,00x2,50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3,80...3,90  
: (3,75...3,95)  
Contr.-rod trav.mm: 9,00...12,00  
Cam sequence : 6-2-4-1-5-3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0,50 (0,75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 13,70...13,80

Del.quantity cm3/ : 23,1...23,3  
100H.: (22,8...23,6)

Dispersion cm3/ : 0,50  
100H.: (0,90)

2nd speed 1/min: 300  
Contr.-rod trav. m: 7,50...7,70  
Del.quantity cm3/ : 2,4...3,0  
100H.: (2,1...3,3)  
Dispersion cm3/ : 0,80  
100H.: (1,20)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 700  
Del.quantity cm3/ : 231,0...233,0  
1000H.: (228,0...236,0)  
Dispersion cm3/ : 5,00  
1000H.: (9,00)

## HIGHEST RATED SPEED

Testing:  
1st c-rod trav.mm : 12,70  
Speed 1/min : 750...755  
2nd c-rod trav.mm : 4,00  
Speed 1/min : 802...815  
4th speed 1/min : 950  
C-rod trav.mm : 0,00...1,00

## ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 12,70  
Speed 1/min : 750...755

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 175,0...195,0  
1000H.: (171,0...199,0)

Remarks:  
: MAN-NR. 2-7775

APPLICATION  
Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : ROL 12,2 I  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 046 778  
  
Injection pump  
Pump designation : PES6P120A320RS3170-1  
EP type number : 0 412 026 726  
Governor  
Governor design. : RQ900PA826  
Governor no. : 0 421 801 365

Customer-spec. information  
Customer : ROLLS ROYCE

Engine : EAGLE LE

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Contr.-rod trav.mm: 9.00...12.00

L17

Cam sequence : 1- 4- 2- 6- 3- 5

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 850

Contr.-rod trav.mm: 13.10...13.20

Del.quantity cm3/ : 21.9...22.1

100H.: (21.6...22.4)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 250.0

Contr.-rod trav. m: 5.9...6.1

Del.quantity cm3/ : 1.7...2.3

100H.: (1.4...2.6)

Dispersion cm3/ : 0.8

100H.: (1.2)

## FULL-LOAD DELIV. AT FULL-LOAD STOP

### 1st version

Speed 1/min: 850

Del.quantity cm3/ : 219.0...221.0

1000H.: (216.0...224.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

## HIGHEST RATED SPEED

### Testing:

1st c-rod trav.mm : 12.10

Speed 1/min : 900...905

2nd c-rod trav.mm : 4.00

Speed 1/min : 936...951

4th speed 1/min : 1000

C-rod trav.mm : 0.00...1.00

## SWITCH-OVER POINT

Speed 1/min : 850

## ROTATIONAL-SPEED LIMITATION

### 1st version

1mm control-rod travel less than

full-load trav.mm: 12.10

Speed 1/min : 900...905

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 140.0...160.0  
1000H.: (136.0...164.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SSC 10,5 D  
Edition : 17.12.86  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 046 780  
  
Injection pump  
Pump designation : PES6P130A320LS3180  
EP type number : 0 412 036 703  
Governor  
Governor design. : RQV300...750PA614  
Governor no. : 0 421 813 316

Customer-spec. information  
Customer : SSCM

Engine : UD25-L6

1st version kW : 368.0  
Speed 1/min: 1500

### TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 443 022

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 060

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.00x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
                  : (2.75...2.95)  
Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

### BASIC SETTING

1st speed 1/mi: 750

Contr.-rod trav.mm: 13.90...14.00

Del.quantity cm3/ : 45.2...45.5

100H.: (45.8...46.8)

Dispersion cm3/ : 0.6

100H.: (1.0)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 4.5...4.7

Del.quantity cm3/ : 1.7...2.3

100H.: (1.3...2.7)

Dispersion cm3/ : 1.0

100H.: (1.4)

(B) Setting of injection pump with  
externally-mounted governor

### SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.30...1.50

2nd speed 1/min: 600

Sleeve travel mm: 5.30...5.80

3rd speed 1/min: 750

Sleeve travel mm: 7.80...8.30

### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 780

Cont.-rod travelmm: 15.20...17.80

### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 750

Del.quantity cm3/ : 452.0...455.0

1000H.: (458.5...468.5)

Dispersion cm3/ : 6.00

1000H.: (10.00)

### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 62...70

Testing:

1st c-rod trav.mm : 12.90  
Speed 1/min : 790...800  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 850...880  
4th speed 1/min : 1000  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: 7...15

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.10  
Speed 1/min : 300  
C-rod trav.mm : 5.20...5.40

CONSTANT REGULATION

Speed 1/min : 325...435

SWITCH-OVER POINT

Speed 1/min : 220 (240)

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 12.90  
Speed 1/min : 790...800

STARTING FUEL DELIVERY

Del.quantity cm3/ : 390.0...420.0  
1000H.: (386.0...424.0)

Remarks:

APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : UNI 9.5 B  
 Edition : 24.8.87  
 Superseded : 10.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 046 782  
 Injection pump  
 Pump designation : PES6P110A72ORS3140  
 EP type number : 0 412 016 716  
 Governor  
 Governor design. : RQV275...1150PA841  
 Governor no. : 0 421 813 586

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8460.21.002

1st version kW : 177.0  
 Speed 1/min: 2300

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 1150

Contr.-rod trav.mm: 11.00...11.10

Del.quantity cm3/ : 13.8...14.1

100H.: (13.5...14.3)

Dispersion cm3/ : 0.40

100H.: (0.75)

2nd speed 1/min: 275

Contr.-rod trav. m: 6.80...7.00

Del.quantity cm3/ : 1.7...2.2

100H.: (1.4...2.4)

Dispersion cm3/ : 0.45

100H.: (0.75)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 250

Sleeve travel mm: 1.00...1.20

2nd speed 1/min: 400

Sleeve travel mm: 2.70...3.00

3rd speed 1/min: 850

Sleeve travel mm: 5.00...5.20

4th speed 1/min: 1150

Sleeve travel mm: 7.30...7.50

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1260

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1150

Charge press. hPa : 700

Del.quantity cm3/ : 138.0...141.0

1000H.: (135.5...143.5)

Dispersion cm3/ : 4.00

1000H.: (7.50)

## HIGHEST RATED SPEED

1st version



Control-lever  
position degrees: 60...68

Testing:  
1st c-rod trav.mm : 10.00  
Speed 1/min : 1190...1200  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1275...1305  
4th speed 1/min : 1400  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 11...19

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 8.40  
Speed 1/min : 275  
C-rod trav.mm : 6.80...7.00

#### CONSTANT REGULATION

Speed 1/min : 275...520

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 700  
Contr.-rod trav.mm: 11.00...11.10

#### Measurement

Speed 1/min : 500  
1st pressure hPa : -  
C-rod trav.mm : 10.50...10.60  
2nd pressure hPa : 290  
C-rod trav.mm : 10.70...10.80

#### SWITCH-OVER POINT

Speed 1/min : 210 (230)

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 500  
Del.quantity cm3/ : 121.0...124.0  
1000H.: (118.5...126.5)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 10.00  
Speed 1/min : 1190...1200

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 120.0...140.0  
1000H.: (116.0...144.0)

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : KHD 9.6 V  
Edition : 03.04.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 402 046 787  
Injection pump  
Pump designation : PES6P110A72ORS3104  
EP type number : 0 412 016 712  
Governor  
Governor design. : RQV375...1000PA862  
Governor no. : 0 421 813 625

Customer-spec. information  
Customer : KHD

Engine : BF6L513R

1st version kW : 156.0  
Speed 1/min: 2000

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Contr.-rod trav. mm: 9.00...12.00  
Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 1000  
Contr.-rod trav. mm: 13.20...13.30  
Del. quantity cm3/ : 13.9...14.1  
100H.: (13.6...14.4)  
Dispersion cm3/ : 0.4  
100H.: (0.7)  
2nd speed 1/min: 375.0  
Del. quantity cm3/ : 1.6...2.2  
100H.: (1.3...2.4)  
Dispersion cm3/ : 0.4  
100H.: (0.7)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 375  
Sleeve travel mm: 0.90...1.10  
2nd speed 1/min: 410  
Sleeve travel mm: 1.60...1.90  
3rd speed 1/min: 550  
Sleeve travel mm: 2.80...3.10  
4th speed 1/min: 1050  
Sleeve travel mm: 8.50...8.60  
5th speed 1/min: 1110  
Sleeve travel mm: 9.50...9.80

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1050  
Contr.-rod travel mm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1000  
Del. quantity cm3/ : 139.0...141.0  
1000H.: (136.0...144.0)  
Dispersion cm3/ : 4.00  
1000H.: (7.50)

## HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 51...59

Testing:

1st c-rod trav.mm : 12.20  
Speed 1/min : 1040...1050  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1090...1120  
4th speed 1/min : 1250  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I

Control-lever  
position degrees: ?

Testing:

Speed 1/min : 100  
C-rod trav.mm min : 1.50  
Speed 1/min : 375  
C-rod trav.mm : ?

CONSTANT REGULATION

Speed 1/min : 375...480

TORQUE CONTROL

Dimension a mm : 0.20  
Torque-control curve - 1st version  
1st speed 1/min : 1000  
C-rod trav.mm : 13.20...13.30  
2nd speed 1/min : 650  
C-rod trav.mm : 13.40...13.50  
3rd speed 1/min : 825  
C-rod trav.mm : 13.30...13.40

SWITCH-OVER POINT

Speed 1/min : 310 (330)

FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 900  
Speed 1/min : 650  
Del.quantity cm3/ : 146.0...150.0  
1000H.: (143.0...153.0)

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 12.20  
Speed 1/min : 1040...1050

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 170.0...200.0  
1000H.: (166.0...204.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : RVI 14,9 H  
Edition : 10.08.87  
Superceeded : -  
Calibrating oil : ISO-4113

Combination no. : 0 402 048 705

Injection pump  
Pump designation : PES8P120A32ORS3199  
EP type number : 0 412 028 705  
Governor  
Governor design. : RQV275...1050PA665  
Governor no. : 0 421 813 370

Customer-spec. information  
Customer : RVI

Engine : MIVR083530

1st version kW : 320.0  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values ----

START OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
                  : (3.45...3.65)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 8- 4- 2- 7- 3- 6-  
                  5

SD ang. spacing°CS: 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 1050

Contr.-rod trav.mm: 11.40...11.50

Del.quantity cm3/ : 20.2...20.4

100H.: (19.9...20.7)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 275.0

Contr.-rod trav. m: 3.8...4.00

Del.quantity cm3/ : 1.7...2.3

100H.: (1.4...2.6)

Dispersion cm3/ : 0.8

100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 275

Sleeve travel mm: 1.40...1.60

2nd speed 1/min: 450

Sleeve travel mm: 3.40...3.80

3rd speed 1/min: 800

Sleeve travel mm: 5.60...6.00

4th speed 1/min: 1050

Sleeve travel mm: 7.50...7.70

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1140

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1050

Charge press. hPa : 700

Del.quantity cm3/ : 202.0...204.0

1000H.: (199.0...207.0)

Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 62...70

Testing:

1st c-rod trav.mm : 10.40

Speed 1/min : 1115...1135

2nd c-rod trav.mm : 4.00

Speed 1/min : 1220...1250

4th speed 1/min : 1350

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 7...15

Testing:

Speed 1/min : 200

C-rod trav.mm min : 5.60

Speed 1/min : 275

C-rod trav.mm : 3.80...4.00

#### CONSTANT REGULATION

Speed 1/min : 280...405

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 700

Contr.-rod trav.mm: 11.40...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 8.70...8.90

2nd pressure hPa : 420

C-rod trav.mm : 10.60...10.70

3rd pressure hPa : 360

C-rod trav.mm : 9.40...9.60

#### SWITCH-OVER POINT

Speed 1/min : 195 (215)

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 700

Speed 1/min : 650

Del.quantity cm3/ : 187.0...193.0

1000H.: (184.0...196.0)

Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 110.0...112.0  
1000H.: (107.0...115.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 10.40  
Speed 1/min : 1115...1135

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 170.0...190.0  
1000H.: (166.0...194.0)

#### LOW IDLE

Speed 1/min : 275  
Contr.-rod trav.mm: 3.80...4.00  
Del.quantity cm3/ : 17.0...23.0  
1000H.: (14.0...26.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Start-of-delivery mark 13° cam angle  
after start of delivery cyl. 1.



SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 12.10

Speed 1/min : 750...755

STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:





SET IDLE AUXILIARY SPRING  
Contr.-rod trav.mm: 2.00

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 11.10  
Speed 1/min : 750...755

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 130.0...150.0  
1000H.: (126.0...154.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,4 L15  
Edition : 24.8.87  
Superceeded : 12.85  
Calibrating oil : ISO-4113

Combination no. : 0 402 076 055

Injection pump  
Pump designation : PES6P110A820LS442-1  
EP type number : 0 412 016 063  
Governor  
Governor design. : RSV300...1100POA485  
-2  
Governor no. : 0 421 833 207

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 407

1st version kW : 122.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

START OF DELIVERY  
Test pressure, bar: 25...27

MOS

Prestroke mm : 3.20...3.30  
: (3.15...3.35)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 1100  
Contr.-rod trav.mm: 9.50...9.60  
Del.quantity cm3/ : 9.4...9.6  
100H.: (9.1...9.8)  
Dispersion cm3/ : 0.4  
100H.: (0.8)

2nd speed 1/min: 300  
Contr.-rod trav. m: 7.70...7.90  
Del.quantity cm3/ : 1.4...2.0  
100H.: (1.1...2.2)  
Dispersion cm3/ : 0.4  
100H.: (0.7)

## SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 800  
Contr.-rod travelmm: 0.30...0.70

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 1100  
Del.quantity cm3/ : 94.0...96.0  
1000H.: (91.5...98.5)  
Dispersion cm3/ : 4.00  
1000H.: (8.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 50...58

Testing:  
1st c-rod trav.mm : 8.40  
Speed 1/min : 1130...1140  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1170...1200  
4th speed 1/min : 1350

C-rod trav.mm : 0.30...1.40

#### LOWEST RATED SPEED I

Control-lever

position degrees: 24...32

Setting point w/out aux. spring

Speed 1/min : 300

Contr.-rod trav.mm: 7.8

Speed 1/min : 300

C-rod trav.mm : 7.80

#### SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1100

C-rod trav.mm : 9.50...9.60

2nd speed 1/min : 600

C-rod trav.mm : 10.40...10.60

3rd speed 1/min : 750

C-rod trav.mm : 10.20...10.40

4th speed 1/min : 950

C-rod trav.mm : 9.60...9.80

#### FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600

Del.quantity cm3/ : 86.0...90.0

1000H.: (83.0...93.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 8.40

Speed 1/min : 1130...1140

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 130.0...150.0

1000H.: (126.0...154.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 11,4 02  
Edition : 13.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 076 717  
  
Injection pump  
Pump designation : PES6P120A82OLS  
3095-10  
EP type number : 0 412 026 715  
Governor  
Governor design. : RSV350...750P1A487-4  
Governor no. : 0 421 833 265

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM407A

1st version kW : 169.0  
Speed 1/min: 1500

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
: (3.95...4.15)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 6- 2- 4- 1- 5- 3

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 6

## BASIC SETTING

1st speed 1/mi: 730

Contr.-rod trav.mm: 12.40...12.50

Del.quantity cm3/ : 19.6...19.8  
100H.: (19.3...20.1)

Dispersion cm3/ : 0.5  
100H.: (0.8)

2nd speed 1/min: 350.0  
Contr.-rod trav. m: 5.7...5.9  
Del.quantity cm3/ : 3.0...4.0  
100H.: (-)  
Dispersion cm3/ : 0.8  
100H.: (1.2)

## SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed 1/min: 700  
Cont.-rod travelmm: 0.30...0.70

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 730  
Del.quantity cm3/ : 196.0...198.0  
1000H.: (193.0...201.0)  
Dispersion cm3/ : 5.00  
1000H.: (8.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 29...37

Testing:  
1st c-rod trav.mm : 11.40  
Speed 1/min : 750...755

2nd c-rod trav.mm : 4.00  
Speed 1/min : 785...795  
4th speed 1/min : 900  
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 5.8  
Speed 1/min : 350  
C-rod trav.mm : 5.80

SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 11.40  
Speed 1/min : 750...755

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 170.0...190.0  
1000H.: (166.0...194.0)

Remarks:  
APPLICATION  
Generator



1st version  
Control-lever  
position degrees: 49...57

Testing:

1st c-rod trav.mm : 8.90  
Speed 1/min : 1130...1140  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1200...1230  
4th speed 1/min : 1350  
C-rod trav.mm : 0.30...1.40

LOWEST RATED SPEED I

Control-lever  
position degrees: 26...34  
Setting point w/out aux. spring  
Speed 1/min : 350  
Contr.-rod trav.mm: 5.1  
Speed 1/min : 350  
C-rod trav.mm : 5.10

SET IDLE AUXILIARY SPRING

Contr.-rod trav.mm: 2.00

FUEL-DELIVERY CHARACTERISTICS

Speed 1/min : 600  
Del.quantity cm3/ : 142.0...146.0  
1000H.: (139.0...149.0)  
Dispersion cm3/ : 7.5  
1000H.: (12.0)

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 8.90  
Speed 1/min : 1130...1140

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 150.0...170.0  
1000H.: (146.0...174.0)

Remarks:



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM 28,8 B  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 402 618 800  
Injection pump  
Pump designation : PE8P120A500/SRS7110  
EP type number : 0 412 628 810

Customer-spec. information  
Customer : MWM

Engine : TBD234V16

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 1- 2- 3- 4- 7- 8-  
5- 6

SD ang. spacing°CS: 0-30-90-120-135-165-  
225-255  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 800  
Contr.-rod trav.mm: 14.90...15.00  
Del.quantity cm3/ : 26.0...26.2  
100H.: (25.7...26.5)  
Dispersion cm3/ : 0.5  
100H.: (0.9)

2nd speed 1/min: 300.0  
Contr.-rod trav. m: 6.5...6.7  
Del.quantity cm3/ : 3.0...4.0  
100H.: (-)  
Dispersion cm3/ : 0.6  
100H.: (1.0)

## STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 200.0...240.0  
1000H.: (196.0...244.0)

Remarks:  
Full-load delivery not known. Set  
according to engine test report.

Pump runs in tandem

APPLICATION  
Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM 28,8 C  
Edition : 02.06.87  
Superceeded : -  
Calibrating oil : ISO-4113

Combination no. : 0 402 618 801

Injection pump  
Pump designation : PE8P120A500/SRS7144  
EP type number : 0 412 628 821

Customer-spec. information  
Customer : MWM

Engine : TBD234V16

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 2- 3- 4- 7- 8-  
5- 6

SD ang. spacing°CS: 0-30-90-120-135-165-  
225-255  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 14.90...15.00

Del.quantity cm3/ : 26.0...26.2

100H.: (25.7...26.5)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300.0

Contr.-rod trav. m: 6.5...6.7

Del.quantity cm3/ : 3.0...4.0

100H.: (-)

Dispersion cm3/ : 0.6

100H.: (1.0)

## STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 200.0...240.0  
1000H.: (196.0...244.0)

Remarks:  
Full-load delivery not known. Set  
according to engine test report.

Pump runs in tandem

## APPLICATION

Ship

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : STE 12,0 C  
Edition : 13.05.87  
Superceeded : 9.86  
Calibrating oil : ISO-4113

Combination no. : 0 402 638 801

Injection pump  
Pump designation : PESP120A920/6LS7127  
EP type number : 0 412 628 817  
Governor  
Governor design. : RQ300/1100PA134-2  
Governor no. : 0 421 801 364

Customer-spec. information  
Customer : STEYR

Engine : WD 815.66

1st version kW : 277.0  
Speed 1/min: 2200

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

START OF DELIVERY  
Test pressure, bar: 25...27

```

Prestroke mm      : 5.00...5.10
                  : (4.95...5.15)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence      : 1- 5- 4- 8- 6- 3-
                   7- 2

```

SD ang. spacing°CS: 0-45-90-135-180-225-270-315

Tolerance  $\pm$  <sup>0.005</sup> : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed      1/mi: 1100

Contr.-rod trav.mm: 11.50...11.60

Del.quantity cm3/ : 17.6...17.8

100H.: (17.3...18.1)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300

Contr.-rod trav. m: 6.30...6.50  
Del.quantity cm3/ : 1.4...2.0

Dispersion cm<sup>3</sup>/ : 0.8  
100H.: (1.2)

### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 17min: 600

Cont.-rod travelmm: 15.60...16.40

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 1100

Charge press. hPa : 1200  
Del. quantity cm3/ : 176.0...178.0  
1000H.: (173.0...181.0)

Dispersion cm<sup>3</sup>/ : 5.00  
1000H.: (9.00)

HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 31...39

Setting point:

Speed 1/min : 600  
Contr.-rod trav.mm: 16.0

Testing:  
1st c-rod trav.mm : 10.50  
Speed 1/min : 1145...1160  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1210...1240  
4th speed 1/min : 1350  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 9...17  
Setting point w/out aux. spring  
Speed 1/min : 300  
Contr.-rod trav.mm: 6.4

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 7.80  
Speed 1/min : 300  
C-rod trav.mm : 6.40  
C-rod trav.mm : 2.00  
Speed 1/min : 400...440

#### TORQUE CONTROL

Dimension a mm : 0.25  
Torque-control curve - 1st version  
1st speed 1/min : 1100  
C-rod trav.mm : 11.50...11.60  
2nd speed 1/min : 700  
C-rod trav.mm : 12.00...12.10  
3rd speed 1/min : 1000  
C-rod trav.mm : 11.60...11.80  
4th speed 1/min : 850  
C-rod trav.mm : 11.80...12.10

compensator (LDA,ADA,ALDA)

1st version  
Setting  
Speed 1/min : 500  
Pressure hPa : 1200  
Contr.-rod trav.mm: 12.00...12.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 9.50...9.60  
2nd pressure hPa : 760  
C-rod trav.mm : 11.50...11.60  
3rd pressure hPa : 470  
C-rod trav.mm : 10.00...10.20

#### FUEL-DELIVERY CHARACTERISTICS

1st version  
Charge press. hPa : 1200  
Speed 1/min : 700

Del.quantity cm3/ : 183.0...191.0  
1000H.: (181.0...193.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 122.0...126.0  
1000H.: (120.0...128.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 10.50  
Speed 1/min : 1145...1160

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 230.0...260.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 300  
Contr.-rod trav.mm: 6.30...6.50  
Del.quantity cm3/ : 14.0...20.0  
1000H.: (11.0...23.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00)

Remarks:  
Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Note inst. in remarks column

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

position degrees: 56...64

Testing:  
1st c-rod trav.mm : 10.60  
Speed 1/min : 1090...1100  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1195...1225  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED I  
Control-lever  
position degrees: 8...16

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 6.10  
Speed 1/min : 400  
C-rod trav.mm : 4.40...4.60

CONSTANT REGULATION  
Speed 1/min : 400...600

TORQUE CONTROL  
Torque-control curve - 1st version  
1st speed 1/min : 1050  
C-rod trav.mm : 11.60...11.80  
2nd speed 1/min : 975  
C-rod trav.mm : 11.90...12.10

compensator (LDA,ADA,ALDA)

1st version  
Setting  
Speed 1/min : 600  
Pressure hPa : 660  
Contr.-rod trav.mm: 12.60...12.80

Measurement  
Speed 1/min : 600  
1st pressure hPa : 300  
C-rod trav.mm : 10.30...10.50  
2nd pressure hPa : 450  
C-rod trav.mm : 11.70...11.90  
3rd pressure hPa : 800  
C-rod trav.mm : 12.70...12.90  
4th pressure hPa : 1050  
C-rod trav.mm : 13.20...13.40

SWITCH-OVER POINT

Speed 1/min : 270 (290)

FUEL-DELIVERY CHARACTERISTICS

1st version  
Charge press. hPa : 1100  
Speed 1/min : 1050

Del.quantity cm3/ : 167.0...170.0  
1000H.: (164.0...173.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.00  
Charge press. hPa : 1100  
Speed 1/min : 775  
Del.quantity cm3/ : 199.0...201.0  
1000H.: (196.0...204.0)  
Dispersion cm3/ : 8.00  
1000H.: 12.00  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 114.0...116.0  
1000H.: (111.0...119.0)  
Dispersion cm3/ : 8.00  
1000H.: 12.00

ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 10.60  
Speed 1/min : 1090...1100

STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 175.0...195.0  
1000H.: (171.0...199.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MWM 21,6 A  
 Edition : 05.06.87  
 Superseded : 9.86  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 640 803  
 Injection pump  
 Pump designation : PE12P120A520/SRS7116  
 EP type number : 0 412 620 801  
 Governor  
 Governor design. : RQV300...1150PA756-1  
 Governor no. : 0 421 813 584

Customer-spec. information  
 Customer : MWM

Engine : TBD234V12

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

START OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1-2-9-10-5-6-11-12-3  
-4-7-8

SD ang. spacing<sup>o</sup>CS: 0-30-60-90-120-150-  
180-210-240-270-300-  
330

Tolerance + - ° : 0.50 (0.75)

#### BASIC SETTING

1st speed 1/mi: 800

Contr.-rod trav.mm: 14.90...15.00

Del.quantity cm3/ : 26.0...26.2

100H.: (25.8...26.6)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 300

Contr.-rod trav. m: 6.50...6.70

Del.quantity cm3/ : 3.2...3.8

100H.: (2.9...4.1)

Dispersion cm3/ : 0.6

100H.: (1.0)

(B) Setting of injection pump with  
externally-mounted governor

#### SLEEVE TRAVELS

1st speed 1/min: 300

Sleeve travel mm: 1.30...1.40

2nd speed 1/min: 350

Sleeve travel mm: 1.60...2.00

3rd speed 1/min: 560

Sleeve travel mm: 2.50...2.90

4th speed 1/min: 1190

Sleeve travel mm: 8.30...8.40

5th speed 1/min: 1280

Sleeve travel mm: 9.60...9.90

#### SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1200

Contr.-rod travelmm: 15.20...17.80

#### FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 800

Charge press. hPa : 900

Del.quantity cm3/ : 260.0...262.0

1000H.: (258.0...266.0)

Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 52...60

Testing:

1st c-rod trav.mm : 13.90

Speed 1/min : 1190...1200

2nd c-rod trav.mm : 4.00

Speed 1/min : 1300...1330

4th speed 1/min : 1400

C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever

position degrees: 14...22

Testing:

Speed 1/min : 100

C-rod trav.mm min : 8.00

Speed 1/min : 300

C-rod trav.mm : 6.50...6.70

#### CONSTANT REGULATION

Speed 1/min : 300...580

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 500

Pressure hPa : 900

Contr.-rod trav.mm: 14.90...15.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

C-rod trav.mm : 9.40...9.60

2nd pressure hPa : 625

C-rod trav.mm : 14.70...14.80

3rd pressure hPa : 250

C-rod trav.mm : 11.40...11.60

#### SWITCH-OVER POINT

Speed 1/min : 220 (240)

#### FUEL-DELIVERY CHARACTERISTICS

1st version

Charge press. hPa : 900

Speed 1/min : 1150

Del.quantity cm3/ : 257.0...263.0

1000H.: (254.0...266.0)



Charge press. hPa : -  
Speed 1/min : 500  
Del. quantity cm<sup>3</sup>/ : 128.0...132.0  
1000H.: (126.0...134.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 13.90  
Speed 1/min : 1190...1200

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del. quantity cm<sup>3</sup>/ : 200.0...240.0  
1000H.: (-)

#### APPLICATION

Installation 2300

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet	: MB 21,9 X
Edition	: 09.03.87
Superceeded	: -
Calibrating oil	: ISO-4113
Combination no.	: 0 402 640 804
Injection pump	
Pump designation	: PE12P120A32OLS7807
EP type number	: 0 412 620 806
Governor	
Governor design.	: RQV350...10SOPA842
Governer no.	: 0 421 813 587

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 444 A

1st version kW : 390.0  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values

## START OF DELIVERY

Test pressure, bar: 25...27

```

Prestroke mm      : 5.20...5.30
                  : (5.15...5.35)
Contr.-rod trav.mm: 9.00...12.00
Cam sequence      : 12-1-5-9-8-3-4-11-10
                  : -2-6-7

```

SD ang. spacing<sup>o</sup>CS: 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance  $\pm$  <sup>0</sup> : 0,50 (0,75)

SD mark cyl. no. : 12

## BASIC SETTING

1st speed      1/mi: 600

Contr.-rod trav.mm: 13.50...13.70

Del.quantity cm3/ : 19.9...20.1

100H.: (19.6...20.4)

Dispersion cm<sup>3</sup>/ : 0.5

100H.: (0.9)

2nd speed 1/min: 350

Contr.-rod trav. m: 5.40...5.60

Del. quantity cm3/ : 1.6...2.2  
100H.: (1.3...2.5)

Dispersion cm<sup>3</sup>/ : 0.8  
100H.: (1.2)

(B) Setting of injection pump with externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 350  
Sleeve travel mm: 1.90...2.10

2nd speed 1/min: 700  
Sleeve travel mm: 4.00...4.40

3rd speed 1/min: 1100  
Sleeve travel mm: 6.80...7.20

4th speed 1/min: 1200  
Sleeve travel mm: 8.30...8.70

## SLEEVE POSITION

Control-lever position  
Degree: -1

Speed 17min: 1150  
Cont.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 600  
Charge press. hPa : 660  
Del. quantity cm3/ : 199.0...201.0  
1000H.: (196.0...204.0)  
Dispersion cm3/ : 5.00  
1000H.: (9.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 59...67

#### Testing:

1st c-rod trav.mm : 11.30  
Speed 1/min : 1090...1100  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1155...1185  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 10...18

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 7.10  
Speed 1/min : 350  
C-rod trav.mm : 5.40...5.60

#### CONSTANT REGULATION

Speed 1/min : 400...600

#### TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1050  
C-rod trav.mm : 12.20...12.40  
2nd speed 1/min : 975  
C-rod trav.mm : 12.60...12.80  
3rd speed 1/min : 875  
C-rod trav.mm : 13.20...13.40  
4th speed 1/min : 700  
C-rod trav.mm : 13.50...13.70

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 600  
Pressure hPa : 660  
Contr.-rod trav.mm: 13.50...13.70

#### Measurement

Speed 1/min : 600

1st pressure hPa : 350  
C-rod trav.mm : 11.30...11.50  
2nd pressure hPa : 500

M21

C-rod trav.mm : 12.80...13.00  
3rd pressure hPa : 830  
C-rod trav.mm : 13.70...13.80  
4th pressure hPa : 1150  
C-rod trav.mm : 13.70...13.90

#### SWITCH-OVER POINT

Speed 1/min : 270 (290)

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 1100  
Speed 1/min : 1050  
Del. quantity cm3/ : 170.0...174.0  
1000H.: (167.0...177.0)  
Dispersion cm3/ : 8.0  
1000H.: (12.0)  
Charge press. hPa : 1100  
Speed 1/min : 750  
Del. quantity cm3/ : 204.0...208.0  
1000H.: (201.0...211.0)  
Dispersion cm3/ : 8.0  
1000H.: (12.0)  
Charge press. hPa : 1100  
Speed 1/min : 1050  
Del. quantity cm3/ : 150.0...154.0  
1000H.: (147.0...157.0)  
Dispersion cm3/ : 8.0  
1000H.: (12.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del. quantity cm3/ : 136.0...138.0  
1000H.: (133.0...141.0)  
Dispersion cm3/ : 8.0  
1000H.: (12.0)

#### ROTATIONAL-SPEED LIMITATION

#### 1st version

1mm control-rod travel less than

full-load trav.mm: 11.30  
Speed 1/min : 1090...1100

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del. quantity cm3/ : 220.0...240.0  
1000H.: (216.0...244.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 21,9 X1  
Edition : 12.12.86  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 640 805  
  
Injection pump  
Pump designation : PE12P120A320LS7807  
EP type number : 0 412 620 806  
Governor  
Governor design. : RQV350...1050PA842-1  
Governor no. : 0 421 813 588

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kW : 478.0  
Speed 1/min: 2100

### TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                   : (5.15...5.35)  
 Contr.-rod trav.mm: 9.00...12.00  
 Cam sequence : 12-1-5-9-8-3-4-11-10  
                   -2-6-7

SD ang. spacing<sup>o</sup>CS: 0-45-60-105-120-165-  
                           180-225-240-285-300-  
                           345

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 12

**BASIC SETTING**

1st speed 1/mi: 650

Contr.-rod trav.mm: 14.70...14.90

Del.quantity cm3/ : 21.7...21.9  
                           100H.: (21.4...22.2)

Dispersion cm3/ : 0.5  
                           100H.: (0.9)

2nd speed 1/min: 350  
 Contr.-rod trav. m: 5.60...5.80  
 Del.quantity cm3/ : 1.6...2.2  
                           100H.: (1.3...2.5)  
 Dispersion cm3/ : 0.8  
                           100H.: (1.2)

(B) Setting of injection pump with externally-mounted governor

**SLEEVE TRAVELS**

1st speed 1/min: 350  
   Sleeve travel mm: 1.90...2.10  
 2nd speed 1/min: 700  
   Sleeve travel mm: 4.10...4.50  
 3rd speed 1/min: 1100  
   Sleeve travel mm: 7.60...8.00  
 4th speed 1/min: 1200  
   Sleeve travel mm: 9.50...9.90

**SLEEVE POSITION**

Control-lever position  
                   Degree: -1  
 Speed 1/min: 1150  
 Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

**1st version**

Speed 1/min: 650  
 Charge press. hPa : 800  
 Del.quantity cm3/ : 217.0...219.0  
                           1000H.: (214.0...222.0)  
 Dispersion cm3/ : 5.00  
                           1000H.: (9.00)

**HIGHEST RATED SPEED****1st version**

Control-lever  
   position degrees: 62...70

**Testing:**

1st c-rod trav.mm : 14.00  
   Speed 1/min : 1090...1100  
 2nd c-rod trav.mm : 4.00  
   Speed 1/min : 1175...1205  
 4th speed 1/min : 1300  
   C-rod trav.mm : 0.00...1.00

**LOWEST RATED SPEED I**

Control-lever  
   position degrees: 11...19

**Testing:**

Speed 1/min : 100  
 C-rod trav.mm min : 7.20  
 Speed 1/min : 350  
 C-rod trav.mm : 5.60...5.80

**CONSTANT REGULATION**

Speed 1/min : 400...600

**TORQUE CONTROL**

Torque-control curve - 1st version

1st speed 1/min : 1050  
   C-rod trav.mm : 15.00...15.20  
 2nd speed 1/min : 975  
   C-rod trav.mm : 15.30...15.50  
 3rd speed 1/min : 900  
   C-rod trav.mm : 15.70...15.90

compensator (LDA,ADA,ALDA)

**1st version****Setting**

Speed 1/min : 600  
 Pressure hPa : 800  
 Contr.-rod trav.mm: 14.70...14.90

**Measurement**

Speed 1/min : 600

1st pressure hPa : 300  
   C-rod trav.mm : 11.30...11.50  
 2nd pressure hPa : 600  
   C-rod trav.mm : 13.80...14.00  
 3rd pressure hPa : 950

G-rod trav.mm : 14.90...15.00  
4th pressure hPa : 1150  
G-rod trav.mm : 15.60...15.80

#### SWITCH-OVER POINT

Speed 1/min : 270 (290)

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 1300  
Speed 1/min : 1050  
Del.quantity cm3/ : 226.0...229.0  
1000H.: (223.0...232.0)

Dispersion cm3/ : 8.0  
1000H.: (12.0)

Charge press. hPa : 1300  
Speed 1/min : 850  
Del.quantity cm3/ : 244.0...248.0  
1000H.: (241.0...251.0)

Dispersion cm3/ : 8.0  
1000H.: (12.0)

Charge press. hPa : 1300  
Speed 1/min : 1050  
Del.quantity cm3/ : 164.0...167.0  
1000H.: (161.0...170.0)

Dispersion cm3/ : 8.0  
1000H.: (12.0)

Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 133.0...135.0  
1000H.: (130.0...138.0)

Dispersion cm3/ : 8.0  
1000H.: (12.0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 14.00  
Speed 1/min : 1090...1100

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...260.0  
1000H.: (236.0...264.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 21,9 V1  
Edition : 24.8.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 640 806  
  
Injection pump  
Pump designation : PE12P120A320LS7806  
EP type number : 0 412 620 805  
Governor  
Governor design. : RQV350...1000PA835-1  
Governor no. : 0 421 813 590

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kW : 419.0  
Speed 1/min: 2000

### TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
                  : (3.95...4.15)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 12-1-5-9-8-3-4-11-10  
                  -2-6-7

SD ang. spacing<sup>o</sup>CS: 0-45-60-105-120-165-  
                          180-225-240-285-300-  
                          345

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 12

## BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 12.80...13.00

Del.quantity cm3/ : 18.7...18.9  
                  100H.: (18.4...19.2)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 350

Contr.-rod trav. m: 5.70...5.90

Del.quantity cm3/ : 1.6...2.2  
                  100H.: (1.3...2.5)

Dispersion cm3/ : 0.8

100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 350

Sleeve travel mm: 1.90...2.10

2nd speed 1/min: 700

Sleeve travel mm: 4.90...5.30

3rd speed 1/min: 1050

Sleeve travel mm: 8.00...8.40

4th speed 1/min: 1200

Sleeve travel mm: 9.40...9.80

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1180

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

## 1st version

Speed 1/min: 600

Charge press. hPa : 650

Del.quantity cm3/ : 187.0...189.0  
                  1000H.: (184.0...192.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

## HIGHEST RATED SPEED

### 1st version

Control-lever

position degrees: 115...123

### Testing:

1st c-rod trav.mm : 11.30

Speed 1/min : 1045...1060

2nd c-rod trav.mm : 4.00

Speed 1/min : 1100...1140

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 64...72

### Testing:

Speed 1/min : 100

C-rod trav.mm min : 7.20

Speed 1/min : 350

C-rod trav.mm : 5.70...5.90

## CONSTANT REGULATION

Speed 1/min : 400...600

compensator (LDA,ADA,ALDA)

## 1st version

### Setting

Speed 1/min : 600

Pressure hPa : 650

Contr.-rod trav.mm: 12.80...13.00

### Measurement

Speed 1/min : 600

1st pressure hPa : 300

C-rod trav.mm : 11.00...11.20

2nd pressure hPa : 420

C-rod trav.mm : 12.10...12.30

3rd pressure hPa : 800

C-rod trav.mm : 13.00...13.10

## SWITCH-OVER POINT

Speed 1/min : 270 (290)

## FUEL-DELIVERY CHARACTERISTICS



1st version

Charge press. hPa : 1150

Speed 1/min : 1000

Del.quantity cm3/ : 182.0...186.0  
1000H.: (179.0...189.0)

Dispersion cm3/ : 8.0

1000H.: (12.0)

Charge press. hPa : 1150

Speed 1/min : 900

Del.quantity cm3/ : 196.0...200.0  
1000H.: (193.0...203.0)

Dispersion cm3/ : 8.0

1000H.: (12.0)

Charge press. hPa : -

Speed 1/min : 500

Del.quantity cm3/ : 125.0...129.0  
1000H.: (122.0...132.0)

Dispersion cm3/ : 8.0

1000H.: (12.0)

#### ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.30

Speed 1/min : 1045...1060

#### STARTING FUEL DELIVERY

Speed 1/min : 100

Del.quantity cm3/ : 170.0...190.0  
1000H.: (166.0...194.0)

Remarks:

## BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 21,9 V 2  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
  
Combination no. : 0 402 640 807  
  
Injection pump  
Pump designation : PE12P120A320LS7806  
EP type number : 0 412 620 805  
Governor  
Governor design. : RQV400...1065PA835-2  
Governor no. : 0 421 813 603

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 444 A

1st version kW : 410.0  
Speed 1/min: 2130

### TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
                  : (3.95...4.15)  
Contr.-rod trav.mm: 9.00...12.00  
Cam sequence : 12- 1- 5- 9- 8- 3 -  
                  4- 11- 10- 2- 6- 7

SD ang. spacing<sup>o</sup>CS: 0-45-60-105-120-165-  
                                  180-225-240-285-300-  
                                  345

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 12

## BASIC SETTING

1st speed 1/mi: 600

Contr.-rod trav.mm: 13.70...13.90

Del.quantity cm3/ : 19.7...20.0

100H.: (19.4...20.3)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 400.0

Contr.-rod trav. m: 5.4...5.6

Del.quantity cm3/ : 1.6...2.2

100H.: (1.3...2.5)

Dispersion cm3/ : 0.8

100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 350

Sleeve travel mm: 1.00...1.20

2nd speed 1/min: 500

Sleeve travel mm: 3.10...3.30

3rd speed 1/min: 1100

Sleeve travel mm: 7.30...7.70

4th speed 1/min: 1225

Sleeve travel mm: 8.30...8.70

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 1180

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

N01

## 1st version

Speed 1/min: 600

Charge press. hPa : 700

Del.quantity cm3/ : 197.0...200.0

1000H.: (194.0...203.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

## HIGHEST RATED SPEED

1st version

Control-lever

position degrees: 57...65

Testing:

1st c-rod trav.mm : 11.70

Speed 1/min : 1105...1115

2nd c-rod trav.mm : 4.00

Speed 1/min : 1210...1240

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

## LOWEST RATED SPEED I

Control-lever

position degrees: 7...15

Testing:

Speed 1/min : 100

C-rod trav.mm min : 6.10

Speed 1/min : 400

C-rod trav.mm : 4.40...4.60

## CONSTANT REGULATION

Speed 1/min : 400...600

## TORQUE CONTROL

Torque-control curve - 1st version

1st speed 1/min : 1065

C-rod trav.mm : 12.70...12.90

2nd speed 1/min : 975

C-rod trav.mm : 13.30...13.50

3rd speed 1/min : 900

C-rod trav.mm : 13.90...14.10

4th speed 1/min : 800

C-rod trav.mm : 14.30...14.50

compensator (LDA,ADA,ALDA)

1st version

Setting

Speed 1/min : 600

Pressure hPa : 700

Contr.-rod trav.mm: 13.70...13.90

Measurement

Speed 1/min : 600

1st pressure hPa : 350

C-rod trav.mm : 11.30...11.50

2nd pressure hPa : 500

C-rod trav.mm : 12.60...12.80  
3rd pressure hPa : 950  
C-rod trav.mm : 14.10...14.20  
4th pressure hPa : 1100  
C-rod trav.mm : 14.20...14.40

#### SWITCH-OVER POINT

Speed 1/min : 270 (290)

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 1100  
Speed 1/min : 1065  
Del.quantity cm3/ : 184.0...188.0  
1000H.: (181.0...191.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.0)

Charge press. hPa : 1100  
Speed 1/min : 800  
Del.quantity cm3/ : 212.0...216.0  
1000H.: (209.0...219.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.0)

Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 125.0...127.0  
1000H.: (122.0...130.0)  
Dispersion cm3/ : 8.00  
1000H.: (12.0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 11.70  
Speed 1/min : 1105...1115

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 190.0...210.0  
1000H.: (186.0...214.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : MB 21,9 J  
Edition : 26.06.87  
Superceeded : -  
Calibrating oil : ISO-4113

Combination no. : 0 402 640 809

Injection pump  
Pump designation : PE12P120A320LS7813  
EP type number : 0 412 620 809  
Governor  
Governor design. : RQV350...1050PA870  
Governor no. : 0 421 813 640

Customer-spec. information  
Customer : DAIMLER-BENZ

Engine : OM 444 LA

1st version kW : 552.0  
Speed 1/min: 2100

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0,8

Test inj. tubing : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

**START OF DELIVERY**

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                   : (5.15...5.35)  
 Contr.-rod trav.mm: 19.00...21.00  
 Cam sequence : 12- 1- 5- 9- 8- 3-  
                   4- 11- 10- 2- 6- 7

SD ang. spacing°CS: 0-45-60-105-120-165-  
180-225-240-285-300-  
345

Tolerance + - ° : 0.50 (0.75)

SD mark cyl. no. : 12

**BASIC SETTING**

1st speed 1/mi: 650

Contr.-rod trav.mm: 14.30...14.50

Del.quantity cm3/ : 22.4...22.6

100H.: (22.1...22.9)

Dispersion cm3/ : 0.5

100H.: (0.9)

2nd speed 1/min: 350.0

Contr.-rod trav. m: 6.2...6.6

Del.quantity cm3/ : 1.6...2.2

100H.: (1.3...2.5)

Dispersion cm3/ : 0.8

100H.: (1.2)

(B) Setting of injection pump with  
externally-mounted governor**SLEEVE TRAVELS**

1st speed 1/min: 350

Sleeve travel mm: 1.90...2.10

2nd speed 1/min: 700

Sleeve travel mm: 4.10...4.50

3rd speed 1/min: 1100

Sleeve travel mm: 7.60...8.00

4th speed 1/min: 1200

Sleeve travel mm: 9.50...9.90

**SLEEVE POSITION**

Control-lever position

Degree: -1

Speed 1/min: 1150

Contr.-rod travelmm: 15.20...17.80

FULL-LOAD DELIV. AT FULL-LOAD STOP

**1st version**

Speed 1/min: 650

Charge press. hPa : 850

Del.quantity cm3/ : 224.0...226.0

1000H.: (221.0...229.0)

Dispersion cm3/ : 5.00

1000H.: (9.00)

**HIGHEST RATED SPEED****1st version**

Control-lever

position degrees: 59...67

**Testing:**

1st c-rod trav.mm : 14.00

Speed 1/min : 1090...1100

2nd c-rod trav.mm : 4.00

Speed 1/min : 1190...1220

4th speed 1/min : 1300

C-rod trav.mm : 0.00...1.00

**LOWEST RATED SPEED 1**

Control-lever

position degrees: 9...17

**Testing:**

Speed 1/min : 100

C-rod trav.mm min : 7.70

Speed 1/min : 350

C-rod trav.mm : 6.20...6.40

**CONSTANT REGULATION**

Speed 1/min : 350...600

**TORQUE CONTROL**

Torque-control curve - 1st version

1st speed 1/min : 1050

C-rod trav.mm : 15.40...15.60

2nd speed 1/min : 1000

C-rod trav.mm : 15.60...15.80

3rd speed 1/min : 950

C-rod trav.mm : 16.00...16.20

compensator (LDA,ADA,ALDA)

**1st version****Setting**

Speed 1/min : 600

Pressure hPa : 850

Contr.-rod trav.mm: 14.30...14.50

**Measurement**

Speed 1/min : 600

1st pressure hPa : 350

C-rod trav.mm : 11.00...11.20

2nd pressure hPa : 600

C-rod trav.mm : 13.40...13.60

3rd pressure hPa : 1200

C-rod trav.mm : 14.60...14.80  
4th pressure hPa : 1400  
C-rod trav.mm : 15.20...15.40

#### SWITCH-OVER POINT

Speed 1/min : 270 (290)

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 1700  
Speed 1/min : 1050  
Del.quantity cm3/ : 256.0...259.0  
1000H.: (253.0...262.0)

Dispersion cm3/ : 8.00  
1000H.: (12.00)

Charge press. hPa : 1700  
Speed 1/min : 900  
Del.quantity cm3/ : 270.0...274.0  
1000H.: (267.0...277.0)

Dispersion cm3/ : 8.00  
1000H.: (12.0)

Charge press. hPa : 1700  
Speed 1/min : 1050  
Del.quantity cm3/ : 185.0...188.0\*  
1000H.: (182.0...191.0)

Dispersion cm3/ : 8.00  
1000H.: 12.00

Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 139.0...141.0  
1000H.: (136.0...144.0)

Dispersion cm3/ : 8.00  
1000H.: (12.0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 14.00  
Speed 1/min : 1090...1100

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 260.0...280.0  
1000H.: (256.0...284.0)

#### Remarks:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,OU14  
 Edition : 19.03.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 646 809  
 Injection pump  
 Pump designation : PE6P120A72ORS7001  
 EP type number : 0 412 626 800  
 Governor  
 Governor design. : RQ200/1000PA616  
 Governor no. : 0 421 801 158

Customer-spec. information  
 Customer : SCANIA

Engine : DS11 15

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)

Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
 Tolerance + -<sup>0</sup> : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 13.20...13.30

Del.quantity cm3/ : 19.9...20.1

100H.: (19.6...20.4)

Dispersion cm3/ : 0.6

100H.: (0.9)

2nd speed 1/min: 225.0

Contr.-rod trav. m: 4.4...4.6

Del.quantity cm3/ : 1.3...1.7

100H.: (-)

Dispersion cm3/ : 0.3

100H.: (0.6)

## SLEEVE POSITION

Control-lever position

Degree: -1

Speed 1/min: 600

Contr.-rod travelmm: 15.60...16.40

## FULL-LOAD DELIV. AT FULL-LOAD STOP

### 1st version

Speed 1/min: 700

Charge press. hPa : 900

Del.quantity cm3/ : 199.0...201.0

1000H.: (196.0...204.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

## HIGHEST RATED SPEED

### 1st version

Control-lever

position degrees: 35...43

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 16.0

## Testing:

1st c-rod trav.mm : 12.20

Speed 1/min : 1045...1060

2nd c-rod trav.mm : 4.00

Speed 1/min : 1115...1145



4th speed 1/min : 1200  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 5...13  
Setting point w/out aux. spring  
Speed 1/min : 225  
Contr.-rod trav.mm: 4.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5.90  
Speed 1/min : 225  
C-rod trav.mm : 4.50  
C-rod trav.mm : 2.00  
Speed 1/min : 300...340

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 13.20...13.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 11.60...11.70  
2nd pressure hPa : 420  
C-rod trav.mm : 12.80...12.90  
3rd pressure hPa : 290  
C-rod trav.mm : 11.90...12.10

#### FUEL-DELIVERY CHARACTERISTICS

##### 1st version

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 193.0...201.0  
1000H.: (191.0...203.0)  
Charge press. hPa : -  
Speed 1/min : 500  
Del.quantity cm3/ : 160.0...164.0  
1000H.: (158.0...166.0)

#### ROTATIONAL-SPEED LIMITATION

##### 1st version

1mm control-rod travel less than

full-load trav.mm: 12.20  
Speed 1/min : 1045...1060

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 225  
Contr.-rod trav.mm: 4.40...4.60  
Del.quantity cm3/ : 13.0...17.0  
1000H.: (-)  
Dispersion cm3/ : 3.00  
1000H.: (6.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on Aug. 18, 1983  
Start of delivery on engine.

Engine model DS 11 - 17° before top  
dead center.

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,0 W2  
 Edition : 24.8.87  
 Superseded : 10.85  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 646 812 Y  
 Injection pump  
 Pump designation : PE6P120A72GRS7007Y  
 EP type number : 0 412 626 803  
 Governor  
 Governor design. : RQV200...1000PA539-2  
 Governor no. : 0 421 813 359

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DSC 11 0

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0,8

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6,00x1,50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

START OF DELIVERY  
 Test pressure, bar : 25...27

Prestroke mm : 4,50...4,60  
 : (4,45...4,65)  
 Contr.-rod trav.mm: 6,00...8,00

M09

Cam sequence : 1-5-3-6-2-4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - ° : 0,50 (0,75)

SD mark cyl. no. : 1

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 7,00...14,70  
 & c-rod trav max. : 21,00  
 Difference ° CS : 1,85...2,55

## BASIC SETTING

1st speed 1/mi: 700

Contr.-rod trav.mm: 16,00...16,10

Del.quantity cm3/ : 22,5...22,7  
 100H.: (22,2...23,0)

Dispersion cm3/ : 0,7  
 100H.: (1,0)

2nd speed 1/min: 225  
 Contr.-rod trav. m: 4,40...4,60  
 Del.quantity cm3/ : 1,4...1,8  
 100H.: (-)  
 Dispersion cm3/ : 0,3  
 100H.: (0,6)

(B) Setting of injection pump with  
 externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 225  
 Sleeve travel mm: 1,30...1,40  
 2nd speed 1/min: 340  
 Sleeve travel mm: 2,30...2,70  
 3rd speed 1/min: 550  
 Sleeve travel mm: 3,90...4,20  
 4th speed 1/min: 1045  
 Sleeve travel mm: 8,10...8,30  
 5th speed 1/min: 1170  
 Sleeve travel mm: 9,70...10,00

## SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed 1/min: 1070  
 Contr.-rod travelmm: 15,20...17,80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700  
Charge press. hPa : 900  
Del.quantity cm3/ : 225,0...227,0  
1000H.: (222,0...230,0)  
Dispersion cm3/ : 7,0  
1000H.: (10,0)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 58...66

#### Testing:

1st c-rod trav.mm : 15,00  
Speed 1/min : 1040...1050  
2nd c-rod trav.mm : 4,00  
Speed 1/min : 1175...1205  
4th speed 1/min : 1300  
C-rod trav.mm : 0,00...1,00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 5...13

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5,90  
Speed 1/min : 225  
C-rod trav.mm : 4,40...4,60  
C-rod trav.mm : 2,00  
Speed 1/min : 310...370

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 16,00...16,10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 11,80...11,90  
2nd pressure hPa : 410  
C-rod trav.mm : 14,00...14,10  
3rd pressure hPa : 290  
C-rod trav.mm : 12,40...12,60

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 216,0...224,0  
1000H.: (214,0...226,0)  
Charge press. hPa : -

N10

Speed 1/min : 500  
Del.quantity cm3/ : 164,0...168,0  
1000H.: (162,0...170,0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 15,00  
Speed 1/min : 1040...1050

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240,0...290,0  
1000H.: (-)  
Contr.-rod trav.mm: 20,00...21,00

#### LOW IDLE

Speed 1/min : 225  
Contr.-rod trav.mm: 4,40...4,60  
Del.quantity cm3/ : 14,0...18,0  
1000H.: (-)  
Dispersion cm3/ : 3,0  
1000H.: (6,0)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without ROB0 diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Firing sequence of engine:  
1-5-3-6-2-4.

Start of delivery - engine:  $22^{\circ}$  before  
TDC at control-rod travel = 6.0...

8.0 mm

Test specifications approved by Scania  
on 1984-12-19

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,0 V3  
 Edition : 24.8.87  
 Superceeded : 8.85  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 646 814  
 Injection pump  
 Pump designation : PE6P120A72ORS7004  
 EP type number : 0 412 626 801  
 Governor  
 Governor design. : RQ900PA528-2  
 Governor no. : 0 421 801 204

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DN 11 40

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 850  
 -----  
 Contr.-rod trav.mm: 10.60...10.70  
 -----  
 Del.quantity cm3/ : 16.2...16.4  
 -----  
 100H.: (15.9...16.7)  
 -----  
 Dispersion cm3/ : 0.5  
 -----  
 100H.: (0.8)

## SLEEVE POSITION

Control-lever position  
 Degree: 45...47  
 Speed 1/min: 600  
 Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 850  
 Del.quantity cm3/ : 162.0...164.0  
 1000H.: (159.0...167.0)  
 Dispersion cm3/ : 5.00  
 1000H.: (8.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 16...24

Setting point:  
 Speed 1/min : 600  
 Contr.-rod trav.mm: 16,5

Testing:  
 1st c-rod trav.mm : 9.60  
 Speed 1/min : 900...905  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 934...948  
 4th speed 1/min : 1000  
 C-rod trav.mm : 0.00...1.00

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 9.60  
Speed 1/min : 900...905

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### HIGH IDLE

Contr.-rod trav.mm: 4.90...5.10  
Dispersion cm3/ : 4.00  
1000H.: (7.00)

#### ADDITIONAL INFORMATION

emarks:

Check and set without R0B0 diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1984-09-19  
Engine start of delivery: 18° BTDC

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator set





1mm control-rod travel less than

full-load trav.mm: 9.60  
Speed 1/min : 750...755

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### HIGH IDLE

Contr.-rod trav.mm: 4.90...5.10  
Dispersion cm3/ : 4.00  
1000H.: (7.00)

#### ADDITIONAL INFORMATION

emarks:

Check and set without ROB0 diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1984-09-19  
Engine start of delivery: 18° BTDC

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,0 J1  
Edition : 13.05.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 402 646 821  
Injection pump  
Pump designation : PE6P120A72ORS7104  
EP type number : 0 412 626 807  
Governor  
Governor design. : RQV200...1000PA725  
Governor no. : 0 421 813 457

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DSC 11 01

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Contr.-rod trav.mm: 6.00...8.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>0</sup>CS: 0-60-120-180-240-300  
Tolerance + -<sup>0</sup> : 0.50 (0.75)

SD mark cyl. no. : 1

## START OF DELIVERY DIFFERENCE

betw.c-rod trav.mm: 7.00...14.70  
& c-rod tray max. : 21.00  
Difference<sup>0</sup> CS : 1.85...2.55

## BASIC SETTING

1st speed 1/mi: 700  
-----  
Contr.-rod trav.mm: 14.70...14.80  
-----  
Del.quantity cm3/ : 21.0...21.2  
-----  
100H.: (20.7...21.5)  
-----  
Dispersion cm3/ : 0.7  
-----  
100H.: (1.0)  
-----  
2nd speed 1/min: 225.0  
Contr.-rod trav. m: 4.4...4.6  
Del.quantity cm3/ : 1.4...1.8  
100H.: (-)  
Dispersion cm3/ : 0.3  
100H.: (0.6)

(B) Setting of injection pump with  
externally-mounted governor

## SLEEVE TRAVELS

1st speed 1/min: 225  
Sleeve travel mm: 1.20...1.40  
2nd speed 1/min: 270  
Sleeve travel mm: 1.80...2.10  
3rd speed 1/min: 340  
Sleeve travel mm: 2.40...2.80  
4th speed 1/min: 1040  
Sleeve travel mm: 8.40...8.60  
5th speed 1/min: 1170  
Sleeve travel mm: 10.10...10.40

## SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed 1/min: 1050  
Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 700  
Charge press. hPa : 900  
Del.quantity cm3/ : 210.0...212.0  
1000H.: (207.0...215.0)  
Dispersion cm3/ : 7.00  
1000H.: (10.00)

#### HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 59...67

#### Testing:

1st c-rod trav.mm : 13.70  
Speed 1/min : 1040...1050  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1150...1180  
4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 5...13

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5.90  
Speed 1/min : 225  
C-rod trav.mm : 4.40...4.60  
C-rod trav.mm : 2.00  
Speed 1/min : 310...370

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 14.70...14.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 11.80...11.90  
2nd pressure hPa : 410  
C-rod trav.mm : 14.00...14.10  
3rd pressure hPa : 290  
C-rod trav.mm : 12.40...12.60

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 205.0...213.0  
1000H.: (203.0...215.0)  
Speed 1/min : 500

Del.quantity cm3/ : 164.0...168.0  
1000H.: (162.0...170.0)

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than  
full-load trav.mm: 13.70  
Speed 1/min : 1040...1050

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 225  
Contr.-rod trav.mm: 4.40...4.60  
Del.quantity cm3/ : 14.0...18.0  
1000H.: (-)  
Dispersion cm3/ : 3.00  
1000H.: (6.00)

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without R0B0 diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Scania test specifications taken over  
on May 17, 1984  
22° before top dead center with  
control-rod travel 6.0...8.0 mm.

Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 9,0 B  
Edition : 09.03.87  
Superceeded : 10.85  
Calibrating oil : ISO-4113  
Combination no. : 0 402 646 822  
Injection pump  
Pump designation : PE6P120A32ORS7102  
EP type number : 0 412 626 804  
Governor  
Governor design. : RQ200/1000PA745  
Governor no. : 0 421 801 283

Customer-spec. information  
Customer : SCANIA

Engine : DS9 03

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>°</sup>CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700  
Contr.-rod trav.mm: 12.00...12.10  
Del.quantity cm3/ : 16.3...16.5  
100H.: (16.0...16.8)  
Dispersion cm3/ : 0.6  
100H.: (0.9)

2nd speed 1/min: 225  
Contr.-rod trav. m: 5.00...5.20  
Del.quantity cm3/ : 1.5...1.9  
100H.: (1.2...2.2)  
Dispersion cm3/ : 0.3  
100H.: (0.6)

## SLEEVE POSITION

Control-lever position  
Degree: 45...47  
Speed 1/min: 600  
Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
Speed 1/min: 700  
Charge press. hPa : 900  
Del.quantity cm3/ : 163.0...165.0  
1000H.: (160.0...168.0)  
Dispersion cm3/ : 6.00  
1000H.: (9.00)

## HIGHEST RATED SPEED

1st version  
Control-lever  
position degrees: 36...44

Setting point:  
Speed 1/min : 600  
Contr.-rod trav.mm: 16.5

Testing:  
1st c-rod trav.mm : 11.00  
Speed 1/min : 1245...1060  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1180...1210

4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 6...14  
Setting point w/out aux. spring  
Speed 1/min : 225  
Contr.-rod trav.mm: 4.9

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 6.30  
Speed 1/min : 225  
C-rod trav.mm : 4.90  
C-rod trav.mm : 2.00  
Speed 1/min : 310...350

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 12.00...12.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 11.30...11.40  
2nd pressure hPa : 420  
C-rod trav.mm : 11.70...11.80  
3rd pressure hPa : 380  
C-rod trav.mm : 11.50...11.70

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 162.0...170.0  
1000H.: (160.0...172.0)  
Speed 1/min : 500  
Del.quantity cm3/ : 141.0...145.0  
1000H.: (139.0...147.0)

#### ROTATIONAL-SPEED LIMITATION

#### 1st version

1mm control-rod travel less than  
full-load trav.mm: 11.00  
Speed 1/min : 1045...1060

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 225  
Contr.-rod trav.mm: 4.80...5.00

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without R0B0 diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1986-10-02  
Start of delivery - engine: 15° before  
TDC  
Firing sequence of engine:  
1-5-3-6-2-4.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 9,0 H  
 Edition : 09.03.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 646 824  
 Injection pump  
 Pump designation : PE6P120A32ORS7111  
 EP type number : 0 412 626 809  
 Governor  
 Governor design. : RQ750PA758  
 Governor no. : 0 421 801 297

Customer-spec. information  
 Customer : SAAB-SCANIA

Engine : DS 9 46,47

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700  
 -----  
 Contr.-rod trav.mm: 12.30...12.40  
 -----  
 Del.quantity cm3/ : 17.7...17.9  
 -----  
 100H.: (17.4...18.2)  
 -----  
 Dispersion cm3/ : 0.6  
 -----  
 100H.: (0.9)

## SLEEVE POSITION

Control-lever position  
 Degree: 45...47  
 Speed 1/min: 600  
 Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 700  
 Del.quantity cm3/ : 177.0...179.0  
 1000H.: (174.0...182.0)  
 Dispersion cm3/ : 6.00  
 1000H.: (9.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 18...26

Setting point:  
 Speed 1/min : 600  
 Contr.-rod trav.mm: 16,5

Testing:  
 1st c-rod trav.mm : 11.30  
 Speed 1/min : 750...755  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 784...797  
 4th speed 1/min : 850  
 C-rod trav.mm : 0.00...1.00

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.30  
Speed 1/min : 750...755

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### HIGH IDLE

Contr.-rod trav.mm: 5.80...6.00  
Dispersion cm3/ : 4.00  
1000H.: (7.00)

#### ADDITIONAL INFORMATION

emarks:

Check and set without ROB0 diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
1987-01-08

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator



# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 9,0 H1  
Edition : 09.03.87  
Superceeded : -  
Calibrating oil : ISO-4113  
Combination no. : 0 402 646 825  
Injection pump  
Pump designation : PE6P120A32ORS7111  
EP type number : 0 412 626 809  
Governor  
Governor design. : RQ900PA758-1  
Governor no. : 0 421 801 298

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS 9 46,47

## TEST BENCH REQUIREMENTS

Calibrating-oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Perforated-plate  
diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set constant delivery quant.  
per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)

Contr.-rod trav.mm: 9.00...12.00

N23

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing°CS: 0-60-120-180-240-300  
Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 850

Contr.-rod trav.mm: 12.30...12.40

Del.quantity cm3/ : 17.9...18.1

100H.: (17.6...18.4)

Dispersion cm3/ : 0.6

100H.: (0.9)

## SLEEVE POSITION

Control-lever position  
Degree: 45...47

Speed 1/min: 600

Contr.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version

Speed 1/min: 850

Del.quantity cm3/ : 179.0...181.0

1000H.: (176.0...184.0)

Dispersion cm3/ : 6.00

1000H.: (9.00)

## HIGHEST RATED SPEED

1st version

Control-lever  
position degrees: 19...27

Setting point:

Speed 1/min : 600

Contr.-rod trav.mm: 16.5

Testing:

1st c-rod trav.mm : 11.30

Speed 1/min : 900...905

2nd c-rod trav.mm : 4.00

Speed 1/min : 941...955

4th speed 1/min : 1000

C-rod trav.mm : 0.00...1.00

## ROTATIONAL-SPEED LIMITATION

1st version

1mm control-rod travel less than

full-load trav.mm: 11.30  
Speed 1/min : 900...905

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### HIGH IDLE

Contr.-rod trav.mm: 5.70...5.90  
Dispersion cm3/ : 4.00  
1000H.: (7.00)

#### ADDITIONAL INFORMATION

emarks:

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
1987-01-08

Start of delivery - engine: 15° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

#### APPLICATION

Generator



1st version  
Control-lever  
position degrees: 57...65

Testing:  
1st c-rod trav.mm : 12.30  
Speed 1/min : 940...950  
2nd c-rod trav.mm : 4.00  
Speed 1/min : 1020...1050  
4th speed 1/min : 1150  
C-rod trav.mm : 0.00...1.00

LOWEST RATED SPEED :  
Control-lever  
position degrees: 8...16

Testing:  
Speed 1/min : 100  
C-rod trav.mm min : 6.80  
Speed 1/min : 350  
C-rod trav.mm : 5.20...5.40

CONSTANT REGULATION  
Speed 1/min : 415...535

#### ROTATIONAL-SPEED LIMITATION

1st version  
1mm control-rod travel less than

full-load trav.mm: 12.30  
Speed 1/min : 940...950

#### LOW IDLE

Speed 1/min : 350  
Contr.-rod trav.mm: 5.20...5.40  
Del.quantity cm3/ : 24.0...30.0  
1000H.: (20.0...34.0)  
Dispersion cm3/ : 10.00  
1000H.: (14.00)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test sheet : SCA 11,0U16  
 Edition : 09.03.87  
 Superceeded : -  
 Calibrating oil : ISO-4113  
 Combination no. : 0 402 646 827  
 Injection pump  
 Pump designation : PE6P120A72ORS7001  
 EP type number : 0 412 626 800  
 Governor  
 Governor design. : RQ200/1000PA713-1  
 Governor no. : 0 421 801 324

Customer-spec. information  
 Customer : SCANIA

Engine : DS11 29

## TEST BENCH REQUIREMENTS

Calibrating-oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Calibrating nozzle-holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Perforated-plate  
 diameter mm : 0.8

Test inj. tubing : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set constant delivery quant.  
 per values -----

## START OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Contr.-rod trav.mm: 9.00...12.00

Cam sequence : 1- 5- 3- 6- 2- 4

SD ang. spacing<sup>o</sup>CS: 0-60-120-180-240-300  
 Tolerance + - : 0.50 (0.75)

SD mark cyl. no. : 1

## BASIC SETTING

1st speed 1/mi: 700  
 -----  
 Contr.-rod trav.mm: 11.70...11.80  
 -----  
 Del.quantity cm3/ : 16.1...16.3  
 -----  
 100H.: (15.8...16.6)  
 -----  
 Dispersion cm3/ : 0.5  
 -----  
 100H.: (0.8)  
 -----

2nd speed 1/min: 225.0  
 Contr.-rod trav. m: 4.9...5.1  
 Del.quantity cm3/ : 1.3...1.7  
 100H.: (-)  
 Dispersion cm3/ : 0.3  
 100H.: (0.6)

## SLEEVE POSITION

Control-lever position  
 Degree: 101...103  
 Speed 1/min: 600  
 Cont.-rod travelmm: 15.20...17.80

## FULL-LOAD DELIV. AT FULL-LOAD STOP

1st version  
 Speed 1/min: 700  
 Charge press. hPa : 900  
 Del.quantity cm3/ : 161.0...163.0  
 1000H.: (158.0...166.0)  
 Dispersion cm3/ : 5.00  
 1000H.: (8.00)

## HIGHEST RATED SPEED

1st version  
 Control-lever  
 position degrees: 35...43

Setting point:  
 Speed 1/min : 600  
 Contr.-rod trav.mm: 16.5

Testing:  
 1st c-rod trav.mm : 10.70  
 Speed 1/min : 1045...1060  
 2nd c-rod trav.mm : 4.00  
 Speed 1/min : 1175...1205

4th speed 1/min : 1300  
C-rod trav.mm : 0.00...1.00

#### LOWEST RATED SPEED I

Control-lever  
position degrees: 5...13  
Setting point w/out aux. spring  
Speed 1/min : 225  
Contr.-rod trav.mm: 4.5

#### Testing:

Speed 1/min : 100  
C-rod trav.mm min : 5.90  
Speed 1/min : 225  
C-rod trav.mm : 4.50  
C-rod trav.mm : 2.00  
Speed 1/min : 300...340

compensator (LDA,ADA,ALDA)

#### 1st version

Setting  
Speed 1/min : 500  
Pressure hPa : 900  
Contr.-rod trav.mm: 11.70...11.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
C-rod trav.mm : 10.40...10.50  
2nd pressure hPa : 220  
C-rod trav.mm : 11.40...11.50  
3rd pressure hPa : 165  
C-rod trav.mm : 10.50...10.70

#### FUEL-DELIVERY CHARACTERISTICS

#### 1st version

Charge press. hPa : 900  
Speed 1/min : 1000  
Del.quantity cm3/ : 160.0...168.0  
1000H.: (158.0...170.0)  
Speed 1/min : 500  
Del.quantity cm3/ : 120.0...124.0  
1000H.: (118.0...126.0)

#### ROTATIONAL-SPEED LIMITATION

#### 1st version

1mm control-rod travel less than

full-load trav.mm: 10.70  
Speed 1/min : 1045...1060

#### STARTING FUEL DELIVERY

Speed 1/min : 100  
Del.quantity cm3/ : 240.0...290.0  
1000H.: (-)  
Contr.-rod trav.mm: 20.00...21.00

#### LOW IDLE

Speed 1/min : 225  
Contr.-rod trav.mm: 4.40...4.60

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm  
Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Check and set without ROBO diaphragm

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on 1986-06-04  
Start of delivery - engine: 15° before  
TDC  
Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus